INFORMATION PACKET

for
Yampa River Basin
Sediment Peer Review Workshop

February 21, 1997

Mussetter Engineering Inc.

AGENDA
for
Yampa River Basin Sediment Peer Review Workshop
February 21, 1995

9:30-9:45	Statement of workshop goals and objectives (George Smith, Bob Mussetter)
9:45-11:00	Presentation of sediment information paper (Bob Mussetter)
11:00-12:00	Discussion of issues to be addressed by the sediment monitoring program (Panel)
12:00-1:00	Lunch
1:00-3:00	Discussion and development of recommendations for the sediment monitoring program (Panel)
3:00-3:30	Summary and clarification of recommendations (Bob Mussetter, George Smith)

John Hamill
Director,
Recovery Program

RECOVERY PROGRAM FOR THE ENDANGERED FISHES OF THE UPPER COLORADO

Ralph Morgenweck
Chairman,
Implementation Committee

U.S. Fish and Wildlife Service • P.O. Box 25486 • Denver Federal Center • Denver, CO 80225 • (303) 236-2985 • Fax (303) 236-0027

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Mail Stop 65115

FEB 11 1997

Memorandum

TO: Yampa River Basin Sediment Peer Review Panel

FROM: George Smith, Chairman, Water Acquisition Committee

SUBJECT: Sediment Peer Review Panel Workshop

Panel Members:

Thank you for agreeing to be a member of the Yampa River Basin Sediment Peer Review Panel. I have attached a copy of the original workshop proposal that outlines the goals and objectives of the panel. Please note that we will be conducting only one workshop (i.e, Tasks 3 and 4, Section VII of the proposal will be combined into a single workshop). The workshop is scheduled for February 21, 1997, at the U.S. Fish & Wildlife Service Offices in Lakewood at 134 Union Boulevard, room 200, just west of the Denver Federal Center. The meeting is planned to run from 9:30 a.m. to 3:30 p.m. with an hour for lunch. I have asked Bob Mussetter, Mussetter Engineering, Inc. (MEI), to be the Workshop Coordinator. MEI is preparing a paper that summarizes the existing sediment data that has been published for the Yampa, Little Snake and Green Rivers. We will provide, for your review, a draft of at least the summary tables and figures from the paper prior to the workshop.

Our goals for the workshop will be to develop recommendations on the types of data that should be collected, how and where the data should be collected, and the level of effort that will be required. Even though there are many important issues related to the endangered species recovery program in this part of the basin, because of the short time that is available for the workshop, it will be critical that we maintain our focus on these specific goals. Based on the results from the workshop, MEI will prepare a recommendations report that can be incorporated into an FY-98 Scope of Work for the sediment monitoring program.

John Hamill
Director,
Recovery Program

RECOVERY PROGRAM FOR THE ENDANGERED FISHES OF THE UPPER COLORADO

Ralph Morgenweck
Chairman,
Implementation Committee

U.S. Fish and Wildlife Service • P.O. Box 25486 • Denver Federal Center • Denver, CO 80225 • (303) 236-2985 • Fax (303) 236-0027

DAVE
THIS IS THE MTG I NEED COVERED. WE REALLY DON'T HAVE ANY PART EXCEPT WE HOLD THE CONTRACT

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A tentative agenda for the meeting is attached. Please feel free to contact me at (303) 236-5322 (ext 325) or E-mail me at george_smith@fws.gov if you have questions or comments. You may also contact Bob Mussetter at (970)224-4612 (E-mail: mussei@aol.com).

Attachments

cc: Interested Parties (mailing list attached)

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CONSERVATION DISTRICT
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AGENDA
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Yampa River Basin Sediment Peer Review Workshop
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COLORADO RIVER WATER
CONSERVATION DISTRICT

FILE: _____

Colorado River Recovery Program
FY-1997 Proposed Scope of Work

Project No.:_____
(Use FY 96 #)

Lead Agency: U. S. Fish and Wildlife Service
Submitted By: George Smith, Division of Water Resources
Address: P.O. Box 25486, DFC, Denver, CO 80225-0486
Phone: (303) 236-5322
Fax: (303) 236-4224
E-mail: George-Smith@fws.gov

Date: July 24, 1996

Category:

_ Ongoing Project
_ Ongoing Revised Project
_ Requested New Project
X Unsolicited Proposal

Expected Funding Source:

_ Annual Funds
X Capital Funds
_ Other (explain)

I. Title of Proposal:

Yampa River Basin Sediment Peer Review Panel

II. Relation to RIPRAP:

Task # Task Description

Yampa River Action Plan: Yampa and Little Snake Rivers
1.A.4.a(3) Yampa River Operation and Management Plan

III. Study Background/Rationale and Hypotheses:

Through the Scope of Work peer review process, the need was identified for a process to better define the need and the appropriate methodologies for sediment data collection and analyses. This Scope of Work was requested by the Program Director and by the Water Acquisition Committee to address the need for sediment monitoring and the appropriate levels of effort needed to have a successful program. Building on the Recovery Program (Program) peer review process, a need was identified to develop an independent peer review panel to review sediment issues facing the Program and develop recommendations for the type of data to be collected and analyzed to meet the needs of the Program.

IV. Study Goals, Objectives, End Products:

A. Goal:

The goal of the peer review effort is to develop recommendations to the Program for a sediment monitoring program to help define habitat requirements for endangered fish in the Yampa, Little Snake, and Green Rivers. This information can, in turn, be used to develop flow recommendations to maintain habitats for endangered fish.

B: Objectives:

(1) To identify and describe sediment issues as they relate to endangered fish habitat in the Yampa, Little Snake, and Green Rivers.

(2) To identify, compile, and summarize existing sediment data for the Yampa, Little Snake, and Green Rivers.

(3) To assemble a peer review panel and present the sediment issues and data to the panel in a workshop forum.

(4) To have the peer review panel develop recommendations for future sediment work to support Program efforts to recover endangered fish.

C. End Products:

(1) A report that presents the results of the peer review panel findings and recommendations.

V. Study Area:

Yampa, Little Snake, and Green River Basins.

VI. Study Method/Approach:

(1) All existing sediment data for the Yampa, Little Snake, and Green Rivers will be identified and summarized, and an information paper will be developed. This task will be accomplished by an expert in the fields of hydrology and sedimentology.

(2) A peer review panel will be selected from experts from both within and without the program. These experts will have direct first hand knowledge of the Yampa, Little Snake, and Green Rivers.

(3) Two workshops will be held with the peer review panel. The first workshop will familiarize the panel with the issues and data. The second workshop will concentrate on the discussion of issues and the development of recommendations. A third workshop/briefing will be held in conjunction with the annual researchers meeting to present the results of the work to Program participants.

VII. Task Description and Schedule:

1) A Workshop Coordinator, an expert in the fields of hydrology and sedimentology, will be retained to identify and summarize sediment issues and data. The Workshop Coordinator will put the information into an informational paper and present the paper to the peer review panel at the first workshop.

2) The peer review panel will be selected from experts from both within and without the Recovery Program. These experts will all have direct first hand knowledge of the Yampa, Little Snake, and Green Rivers.

3) A workshop will be held where the sediment information paper summarizing the issues and previous sediment work will be presented to the expert panel by the Workshop Coordinator.

4) A second workshop will be held for discussion between the peer review panel and development of recommendations on the types of data to be collected, how data should be collected, and the level of effort needed to collect the data.

5) A third workshop/briefing will be held in conjunction with the annual researchers meeting to present the results of the work to Recovery Program participants.

6) The Workshop Coordinator will produce a report to document the results of the process. The report will summarize the issues and contain recommendations for collection and analysis of sediment data, including gages which will be needed to support future sediment studies. This information will be incorporated into a FY-98 Scope of work for sediment monitoring work.

VIII. Study Schedule:

Select Workshop Coordinator	Oct- 1996
Develop Sediment Issues Paper	Oct -Nov 1996
Conduct Workshops	Dec-Jan 1996, 97
Report Preparation	Feb-1997
Draft Report	Mar-1997
Final Report	Sep-1997

Yampa River Basin Sediment Peer Review Panel
and Interested Parties

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COLORADO RIVER WATER
CONSERVATION DISTRICT
FILE#

Panel

Ned Andrews
USGS Water Resources Division
3215 Marine St.
Boulder CO 80303

John Elliott
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P.O. Box 25046, DFC
Denver CO 80225-0046

Mike Harvey &
Bob Mussetter--Work Shop Coordinator
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Fort Collins CO 80527-0785

Jim O'Brien
FLO Engineering
P.O. Box 66
102 County Road 2315
Nutriso NM 85932

Paul von Gerard
USGS
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Federal Building
Grand Junction Co 81501

Interested Parties

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1313 Sherman St., Room 721
Denver CO 80203-2279

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Denver CO 80225

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Ed Wick
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National Park Service
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Fort Collins CO 80525

Pat Nelson
U.S. Fish & Wildlife Service
Fishery Resources (CR)
P.O. Box 25486, DFC
Denver CO 80225

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FY-1997 Proposed Scope of Work

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Colorado River Water Conservation
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P.O. Box 1120
Glenwood Springs CO 81602

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Cooperative Park Studies Unit
National Park Service
1201 Oakridge Drive, Suite 250
Fort Collins CO 80525

Pat Nelson
U.S. Fish & Wildlife Service
Fishery Resources (CR)
P.O. Box 25486, DFC
Denver CO 80225

USGS Published Data at Stream Gages

Station ID	Station Name	Period of Record (Water Years)	Record Count		Drainage Area (mi^2)	Annual Peak Discharge (cfs)	
			Annual	Partial Duration		Average	Maximum
09235450	Vermillion Creek at Ink Springs Ranch, CO	1977-1981	5	5	816	316	614
09251000	**Yampa River near Maybell, CO**	**1904-Present (cont. since1916)**	**81**	**101**	**3,410**	**10,200**	**25,100**
09260000	Little Snake River near Lily, CO	1923-Present	71	123	3,730	5,460	16,700
09260050	**Yampa River at Deerlodge Park, CO**	**1982-Present**	**13**	**13**	**7,660**	**14,500**	**33,200**
09225500	Green River near Linwood, UT	1929-1962	34	34	18,300	10,900	18,000
09230500	Green River at Flaming Gorge near Linwood, UT	1924-1938	15	15	4900?	10,700	15,400
09234500	**Green River near Greendale, UT**	**1951-Present**	**44**	**51**	**19,350**	**6,900**	**19,600**
09234700	Red Creek near Dutch John, UT	1971-1976	6	6	140	600	1,440
09235100	Crouse Creek near Vernal, UT	1987-1990	4	4	30	12	33
09235800	Pot Creek near Vernal, UT	1958-1982	25	25	107	67	286
09260500	Jones Hole Creek near Jensen, UT	1951-1961	7	7	120	441	968
09261000	**Green River near Jensen, UT**	**1904-Present(cont. since 1947)**	**50**	**79**	**29,660**	**19,600**	**40,000**
09263500	Brush Creek near Jensen, UT	1940-1965	26	33	255	321	900
09263700	Cliff Creek near Jensen, UT	1960-1974	15	15	64	433	1,360
09263800	Cow Wash near Jensen, UT	1960-1974	14	14	39	556	2,950
09271500	Ashley Creek near Jensen, UT	1947-1983	37	37	383	1,010	3,660
09302000	Duchesne River near Randlett, UT	1943-Present	52	52	4,247	4,250	11,500
09306900	White River at mouth near Ouray, UT	1975-1986	12	12	5,120	3,580	5,660
09307000	**Green River near Ouray, UT**	**1948-1966**	**18**	**29**	**35,500**	**26,100**	**43,600**
09307300	Pariette Draw at mouth near Ouray, UT	1976-1984	9	9	298	208	450
09308000	Willow Creek near Ouray, UT	1947-1983	26	26	897	1,330	11,000
09308500	Minnie Maud Creek near Myton, UT	1952-1989	36	40	32	237	1,370
09314500	Price River at Woodside, UT	1909-1992 (cont. 1950-1992)	49	100	1,540	4,540	11,200
09315000	**Green River at Green River, UT**	**895-Present (cont. since 1905)**	**94**	**191**	**44,850**	**29,100**	**68,100**
09315500	Saleratus Wash at Green River, UT	1949-1970	22	55	180	3,270	14,200
09316000	Browns Wash near Green River, UT	1949-1968	19	40	75	2,450	5,620
09328500	San Rafael River near Green River, UT	1909-Present (cont. since 1946)	58	75	1,628	2,690	12,000

Station ID	Station Name	Period of Record (Water Years)	Record Count Years	Record Count Days	Drainage Area (mi^2)	Mean Daily Discharge (cfs)
09235450	Vermillion Creek at Ink Springs Ranch, CO	1977-1981	5	1,571	816	11
09251000	**Yampa River near Maybell, CO**	**1916-Present**	**79**	**28,672**	**3,410**	**1,546**
09260000	Little Snake River near Lily, CO	1922-Present	73	26,663	3,730	569
09260050	**Yampa River at Deerlodge Park, CO**	**1982-Present**	**13**	**4,566**	**7,660**	**2,153**
09225500	Green River near Linwood, UT	1929-1963	35	12,600	18,300	1,928
09230500	Green River at Flaming Gorge near Linwood, UT	N/A	----	----	4900?	----
09234500	**Green River near Greendale, UT**	**1951-Present**	**45**	**16,198**	**19,350**	**2,062**
09234700	Red Creek near Dutch John, UT	1971-1976	6	2,069	140	8.0
09235100	Crouse Creek near Vernal, UT	1987-1990	4	1,461	30	1.3
09235800	Pot Creek near Vernal, UT	1957-1982	26	9,161	107	1.8
09260500	Jones Hole Creek near Jensen, UT	1951-1956, 1961	7	2,557	120	36
09261000	**Green River near Jensen, UT**	**1947-Present**	**49**	**17,607**	**29,660**	**4,298**
09263500	Brush Creek near Jensen, UT	1939-1965	27	9,650	255	19
09263700	Cliff Creek near Jensen, UT	N/A	----	----	64	----
09263800	Cow Wash near Jensen, UT	N/A	----	----	39	----
09271500	Ashley Creek near Jensen, UT	1947-1984	38	13,515	383	57
09302000	Duchesne River near Randlett, UT	1943-Present	54	19,033	4,247	559
09306900	White River at mouth near Ouray, UT	1969-1986	14	4,611	5,120	846
09307000	**Green River near Ouray, UT**	**1948-1955, 1957-1966**	**18**	**6,574**	**35,500**	**5,427**
09307300	Pariette Draw at mouth near Ouray, UT	1975-1984	10	3,300	298	23
09308000	Willow Creek near Ouray, UT	1947-1955, 1975-1984	19	6,316	897	27
09308500	Minnie Maud Creek near Myton, UT	1950-1955, 1958-1990	39	13,577	32	5.8
09314500	Price River at Woodside, UT	1946-1993	48	1,714	1,540	122
09315000	**Green River at Green River, UT**	**1895-1899, 1905-Present**	**96**	**34,715**	**44,850**	**6,243**
09315500	Saleratus Wash at Green River, UT	1949-1970	22	8,035	180	3.0
09316000	Browns Wash near Green River, UT	1949-1968	20	7,154	75	1.0
09328500	San Rafael River near Green River, UT	1910-1918, 1946-Present	59	21,304	1,628	147

Station ID	Station Name	Period of Record (Water Years)	Record Count		
			C_{susp}(mg/l)	Q_{susp}(T/day)	Size Dist.
09235450	Vermillion Creek at Ink Springs Ranch, CO	1977-1981	27	25	6
09251000	**Yampa River near Maybell, CO**	**1951-1993**	**601**	**104**	**54**
09260000	Little Snake River near Lily, CO	1958-1986	598	427	144
09260050	**Yampa River at Deerlodge Park, CO**	**1982-1983**	**59**	**27**	33
09225500	Green River near Linwood, UT	N/A	----	----	----
09230500	Green River at Flaming Gorge near Linwood, UT	N/A	----	----	----
09234500	**Green River near Greendale, UT**	**1975-1988**	**118**	**68**	**74**
09234700	Red Creek near Dutch John, UT	1971-1976	70	69	69
09235100	Crouse Creek near Vernal, UT	N/A	----	----	----
09235800	Pot Creek near Vernal, UT	N/A	----	----	----
09260500	Jones Hole Creek near Jensen, UT	N/A	----	----	----
09261000	**Green River near Jensen, UT**	**1951-1989**	**289**	**155**	**183**
09263500	Brush Creek near Jensen, UT	N/A	----	----	----
09263700	Cliff Creek near Jensen, UT	N/A	----	----	----
09263800	Cow Wash near Jensen, UT	N/A	----	----	----
09271500	Ashley Creek near Jensen, UT	N/A	----	----	----
09302000	Duchesne River near Randlett, UT	1975-1989	130	74	7
09306900	White River at mouth near Ouray, UT	1975-1986	183	156	63
09307000	**Green River near Ouray, UT**	**1952-1967**	**194**	**117**	**171**
09307300	Pariette Draw at mouth near Ouray, UT	1976-1984	81	58	3
09308000	Willow Creek near Ouray, UT	1974-1983	77	75	56
09308500	Minnie Maud Creek near Myton, UT	N/A	----	----	----
09314500	Price River at Woodside, UT	1975-1988	122	78	5
09315000	Green River at Green River, UT	1951-1991	549	451	362
09315500	Saleratus Wash at Green River, UT	N/A	----	----	----
09316000	Browns Wash near Green River, UT	N/A	----	----	----
09328500	San Rafael River near Green River, UT	1951-1991	261	214	132

Station ID	Station Name	Period of Record (Water Years)	Number of Samples
09235450	Vermillion Creek at Ink Springs Ranch, CO	1977-1978	2
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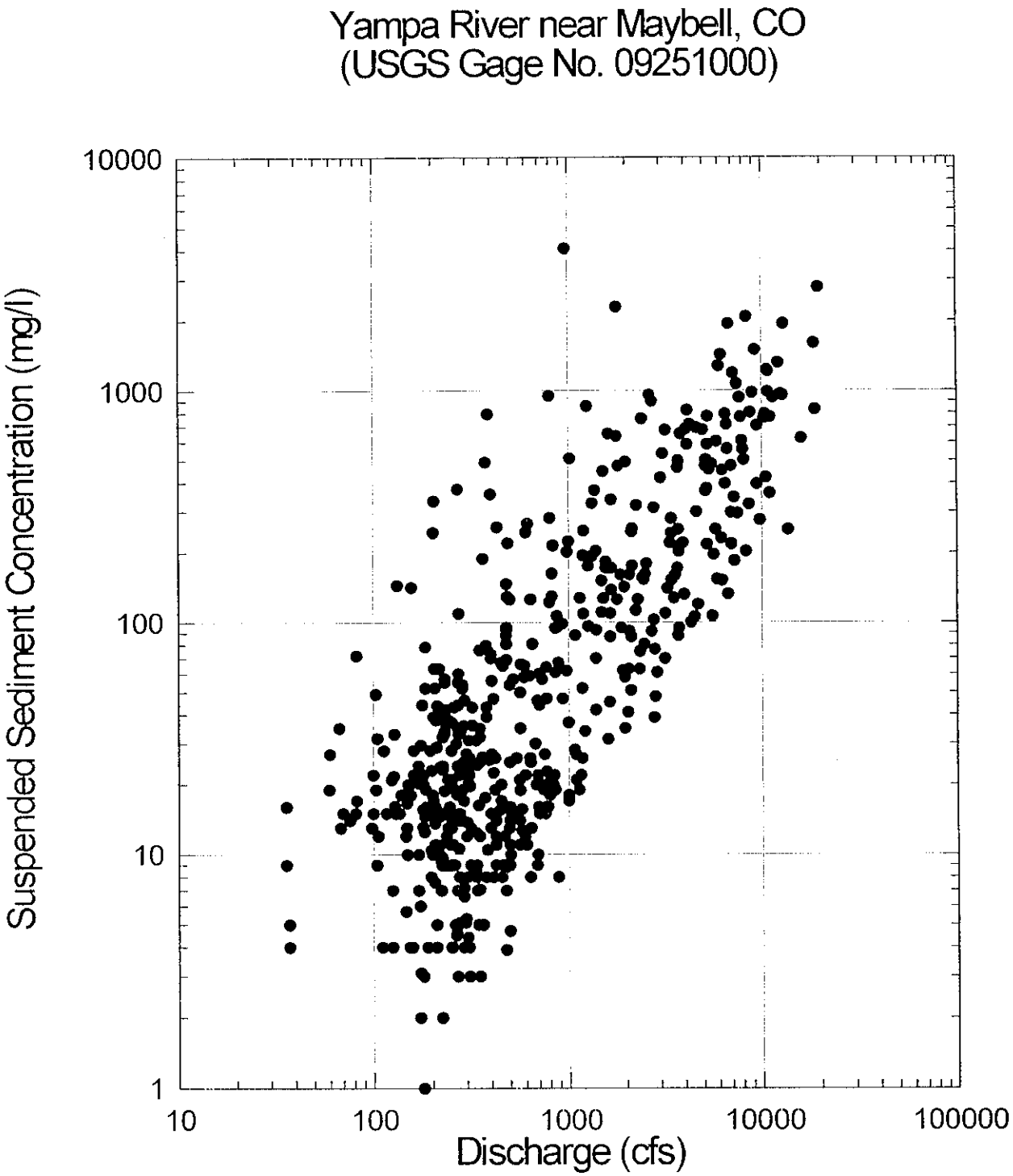
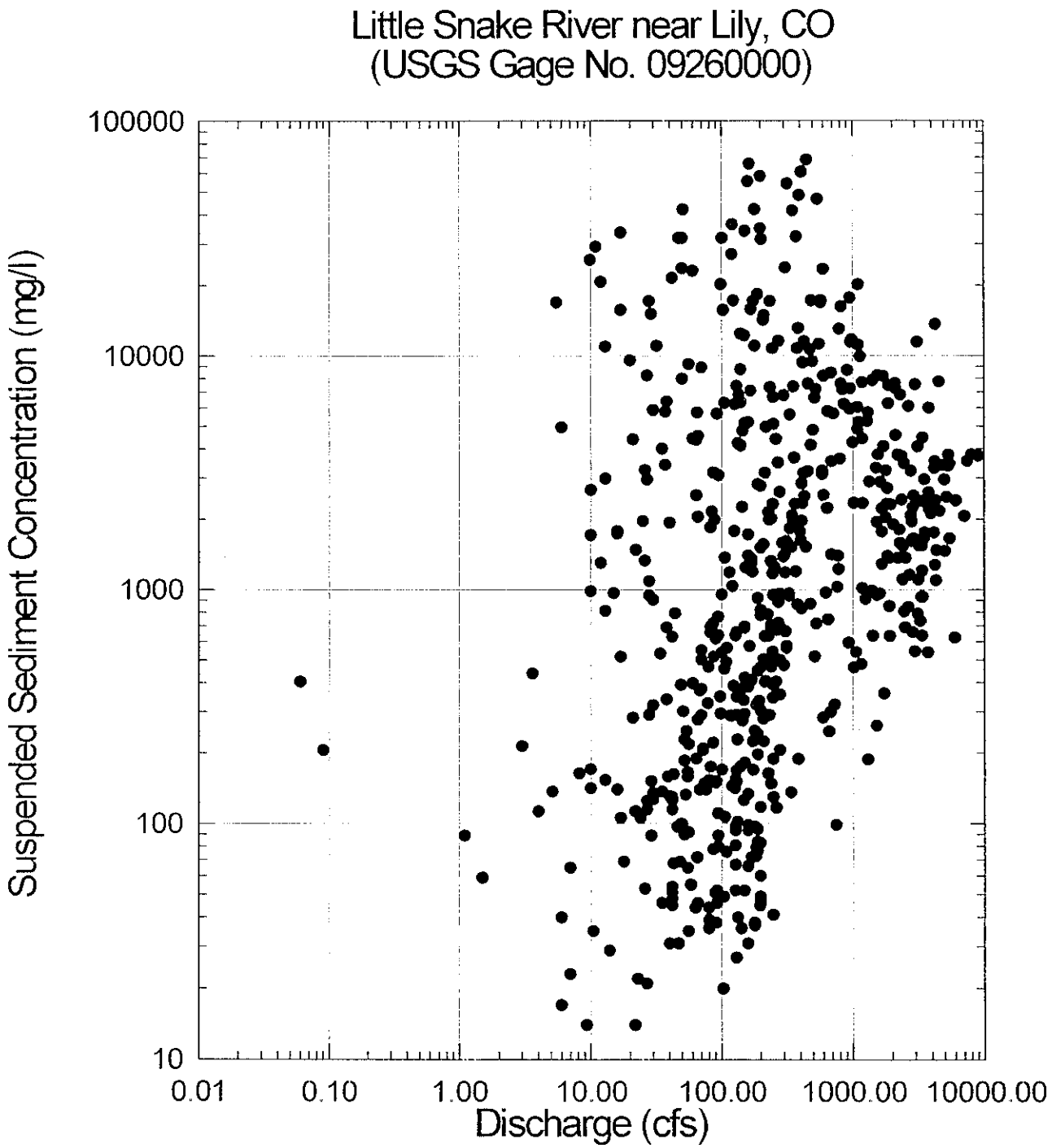
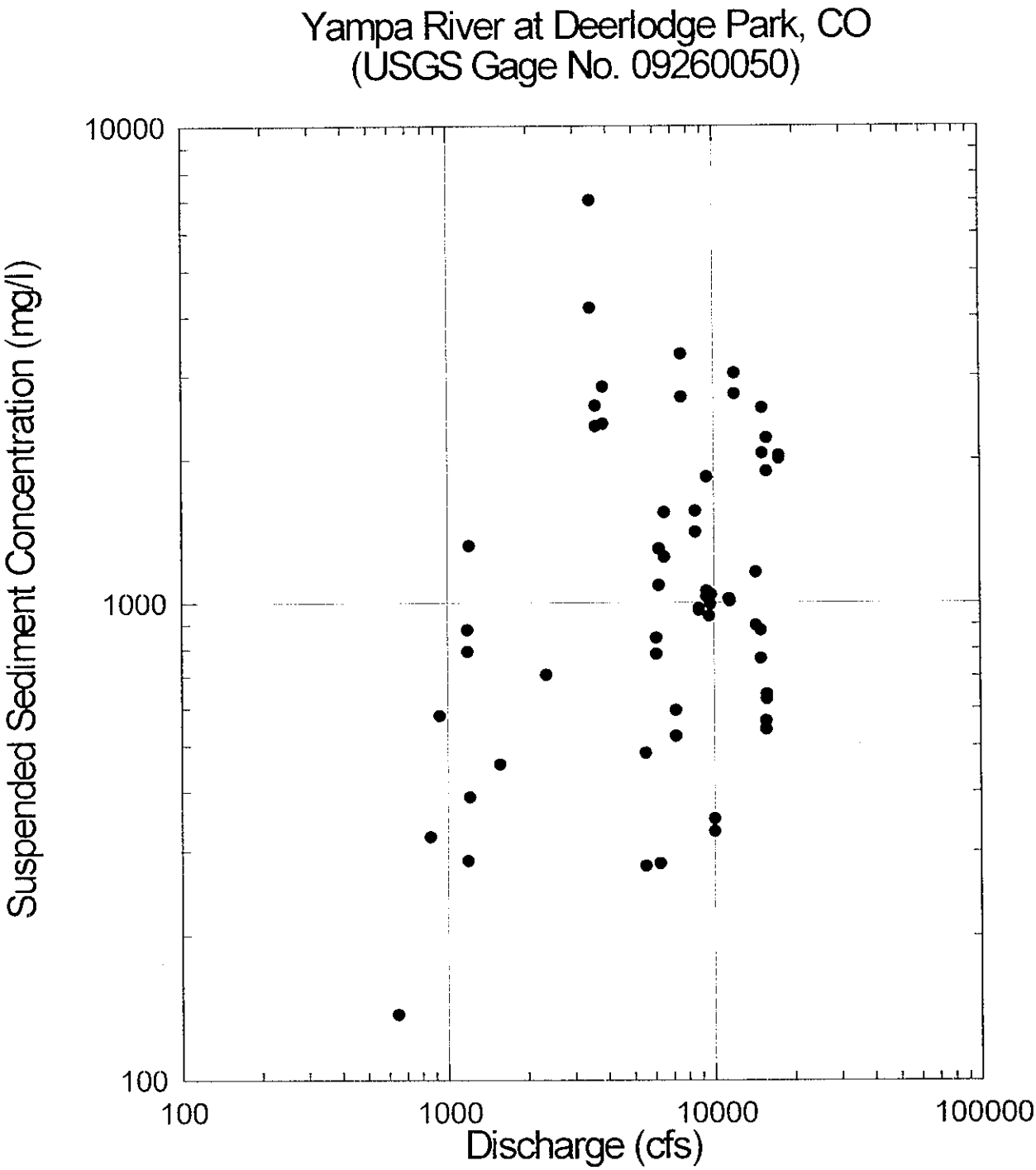
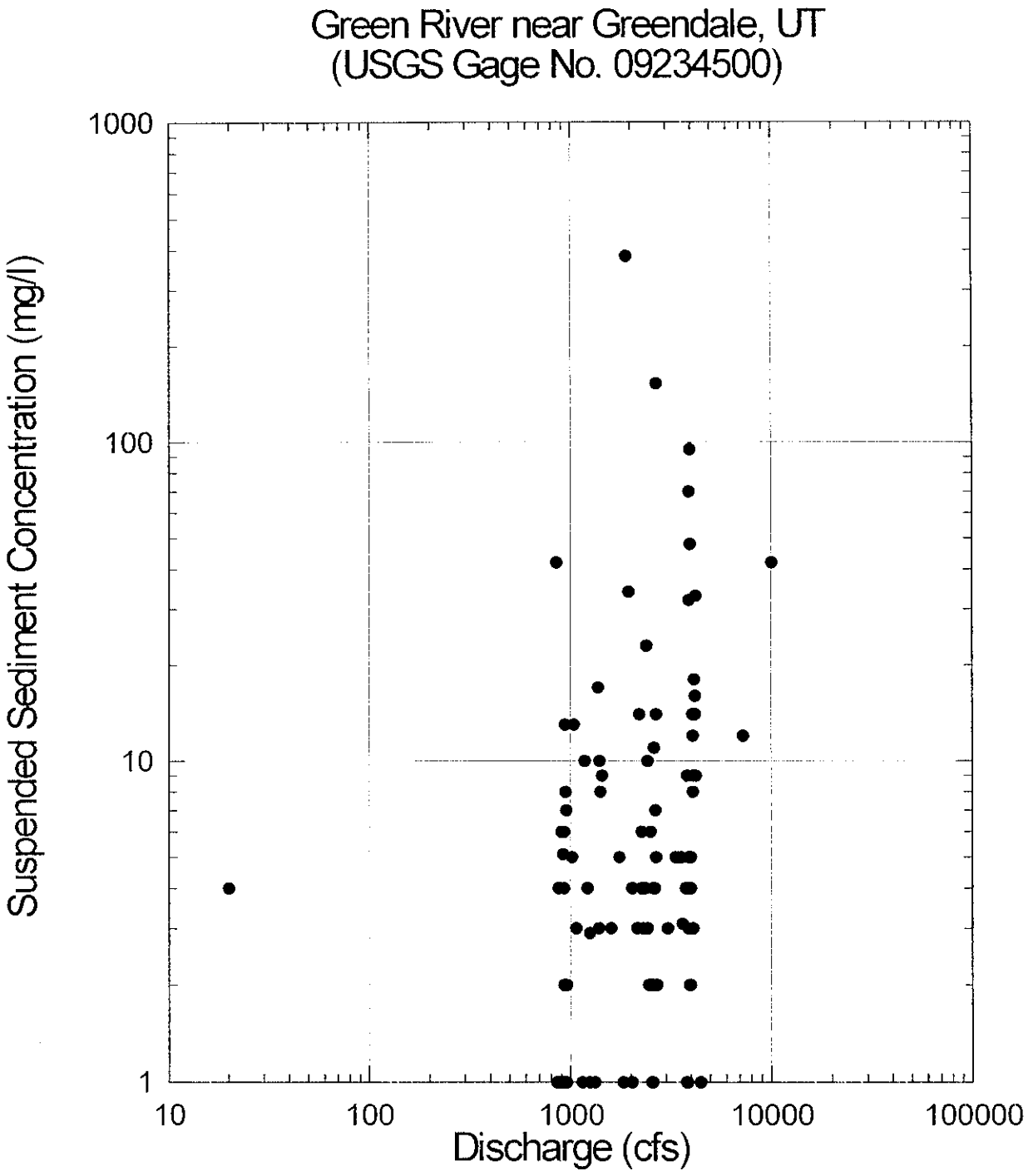
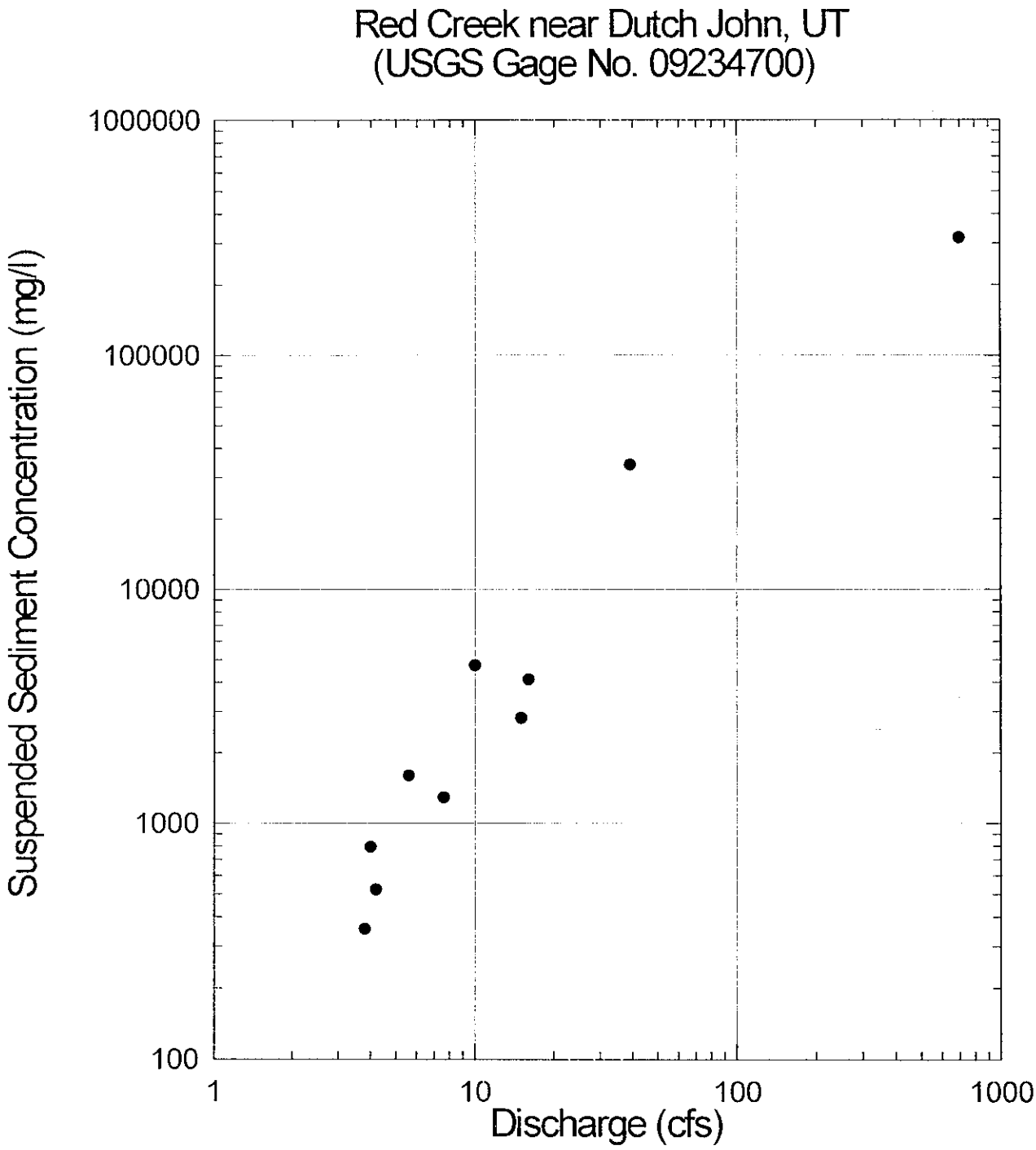
09260000	Little Snake River near Lily, CO	1983	1
09234700	Red Creek near Dutch John, UT	1971-1976	20
09306900	White River at mouth near Ouray, UT	1977-1983	4
09307300	Pariette Draw at mouth near Ouray, UT	1976	4
09308000	Willow Creek near Ouray, UT	1975-1977	9
09315000	**Green River at Green River, UT**	**1973-1978**	**9**

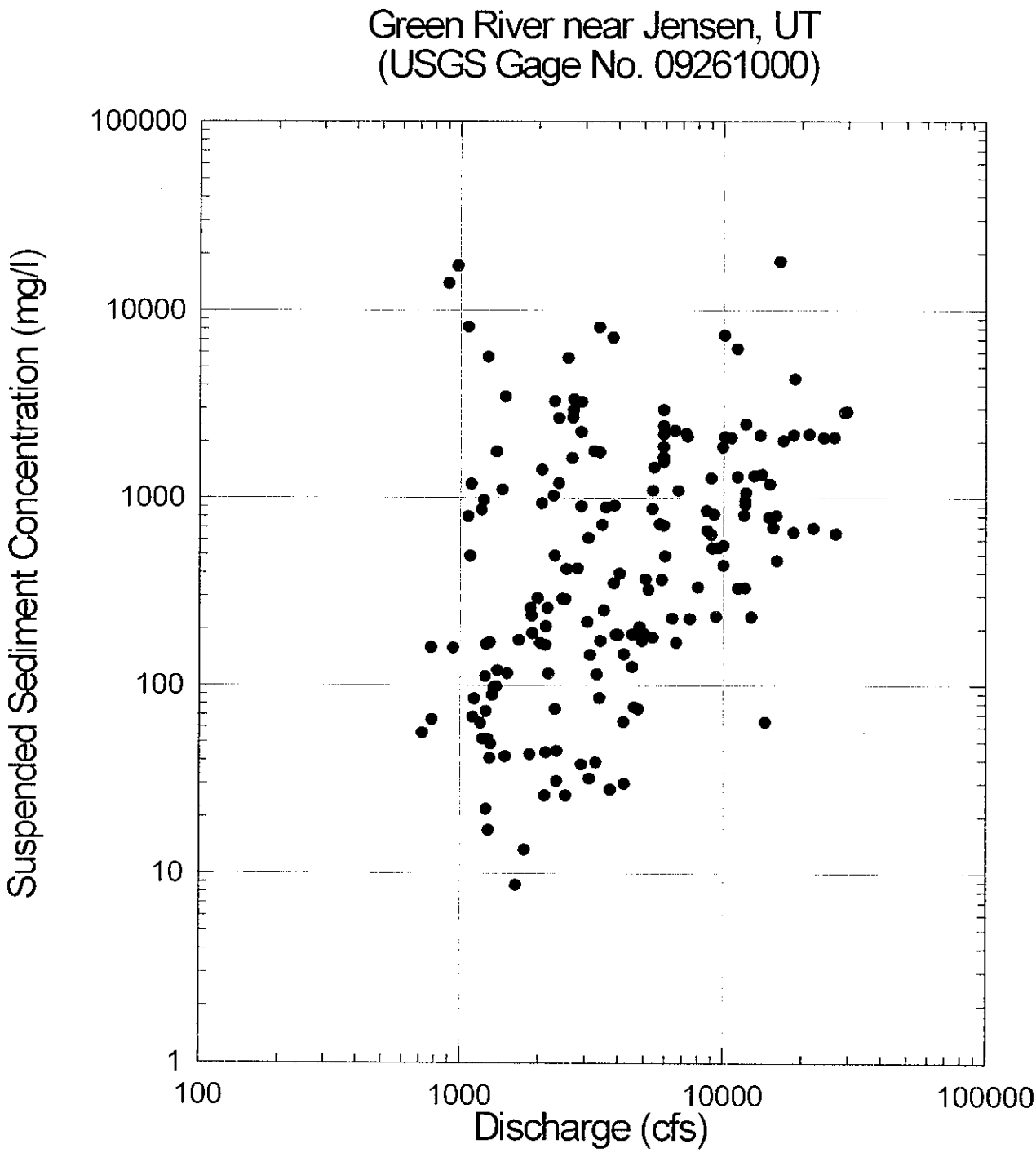

Yampa River near Maybell, CO
(USGS Gage No. 09251000)
Suspended Sediment Concentration (mg/l)
10000
1000
100
10
1
10
100
1000
10000
100000
Discharge (cfs)

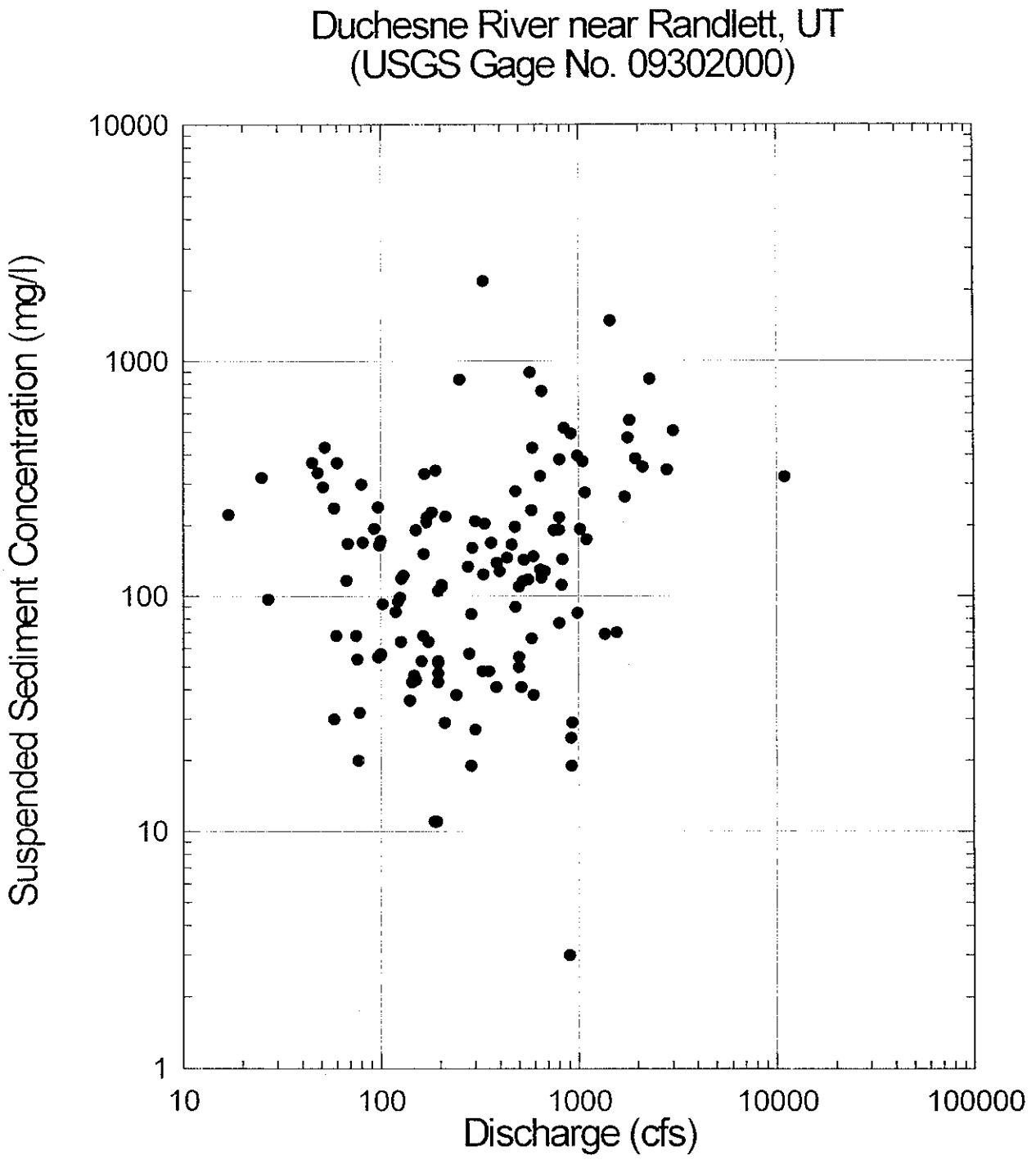

Little Snake River near Lily, CO
(USGS Gage No. 09260000)
Suspended Sediment Concentration (mg/l)
100000
10000
1000
100
10
0.01
0.10
1.00
10.00
100.00
1000.00
10000.00
Discharge (cfs)

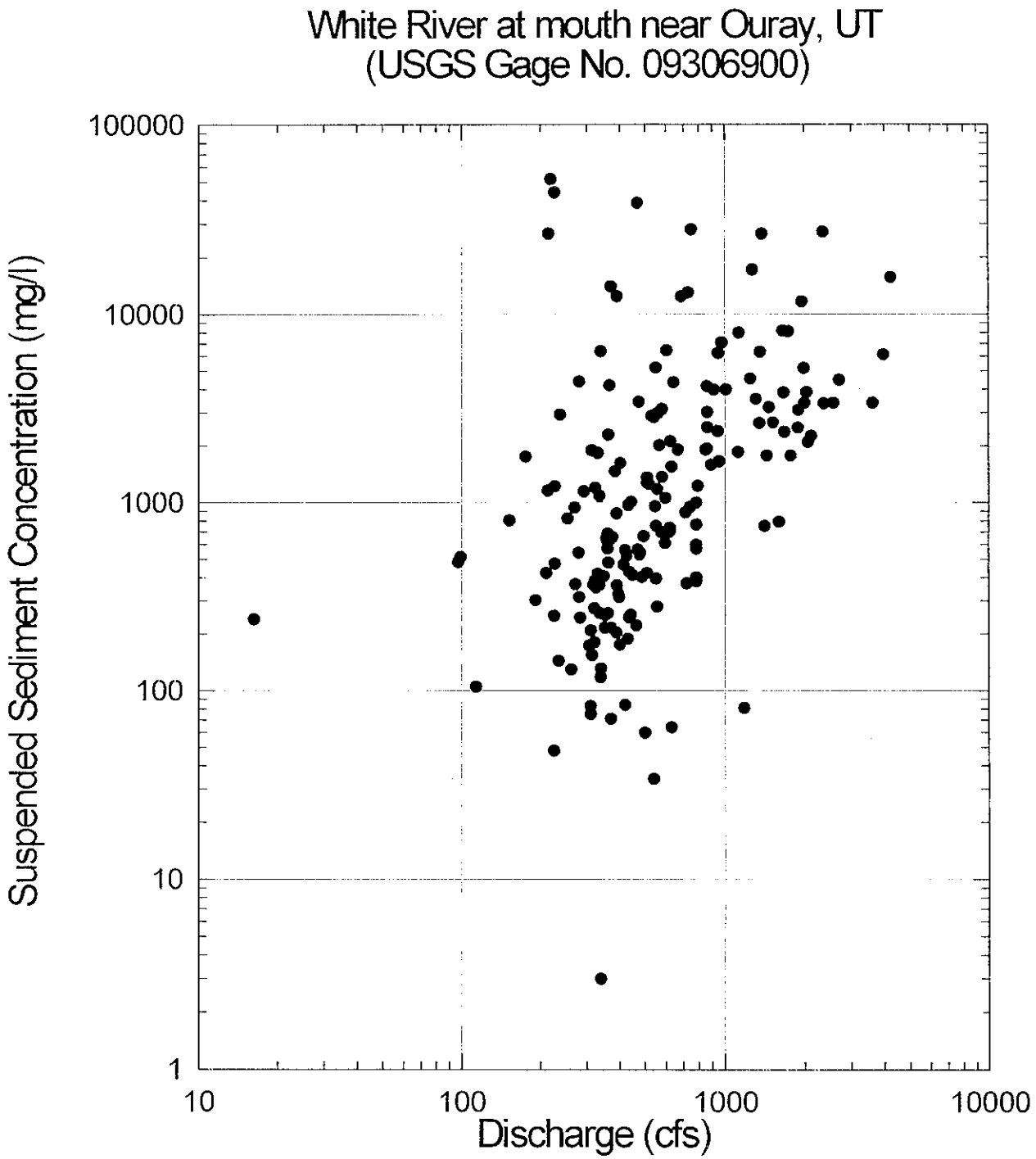

Yampa River at Deerlodge Park, CO
(USGS Gage No. 09260050)
Suspended Sediment Concentration (mg/l)
10000
1000
100
100
1000
10000
100000
Discharge (cfs)

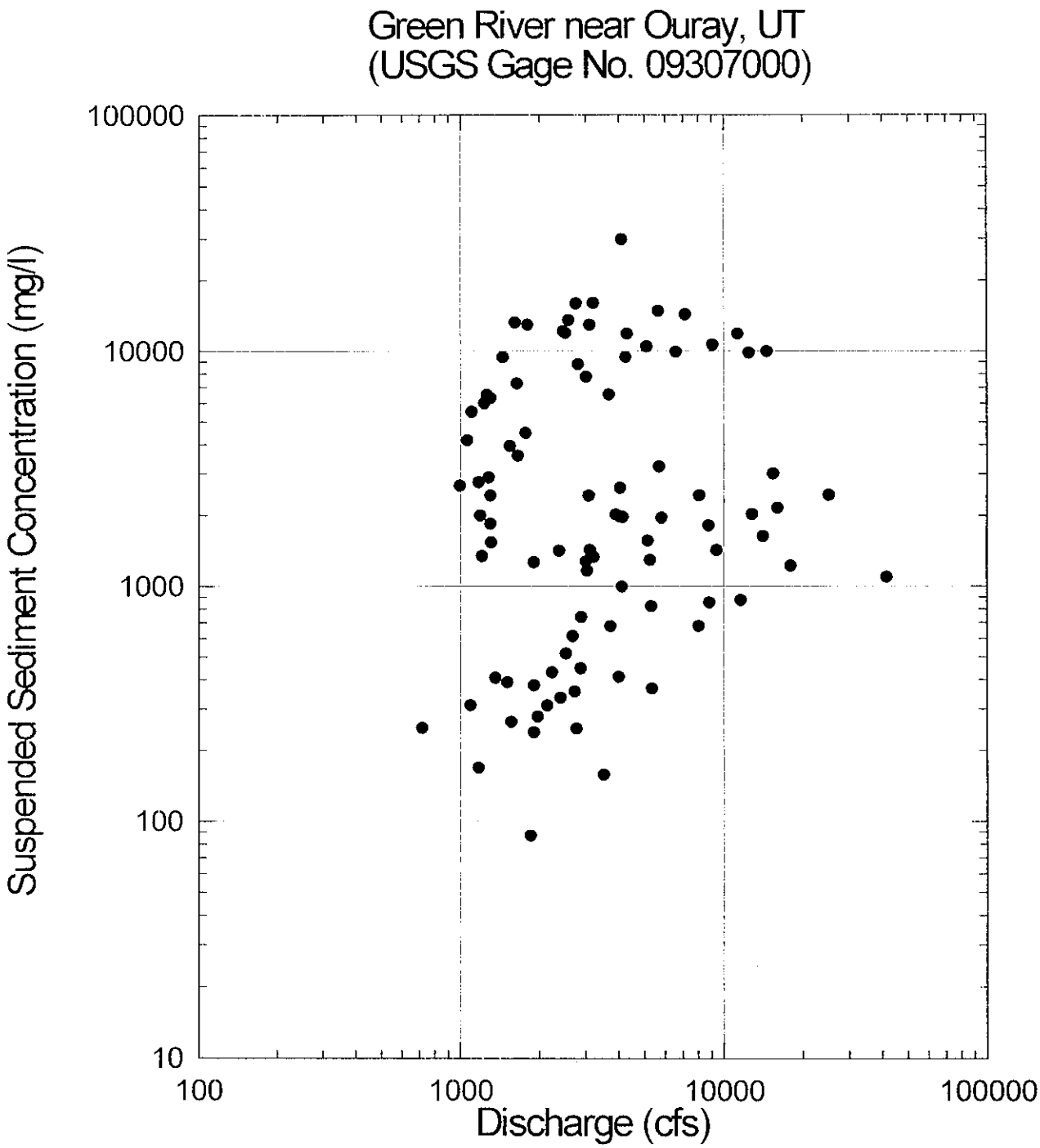

Green River near Greendale, UT
(USGS Gage No. 09234500)
Suspended Sediment Concentration (mg/l)
1000
100
10
1
10
100
1000
10000
100000
Discharge (cfs)

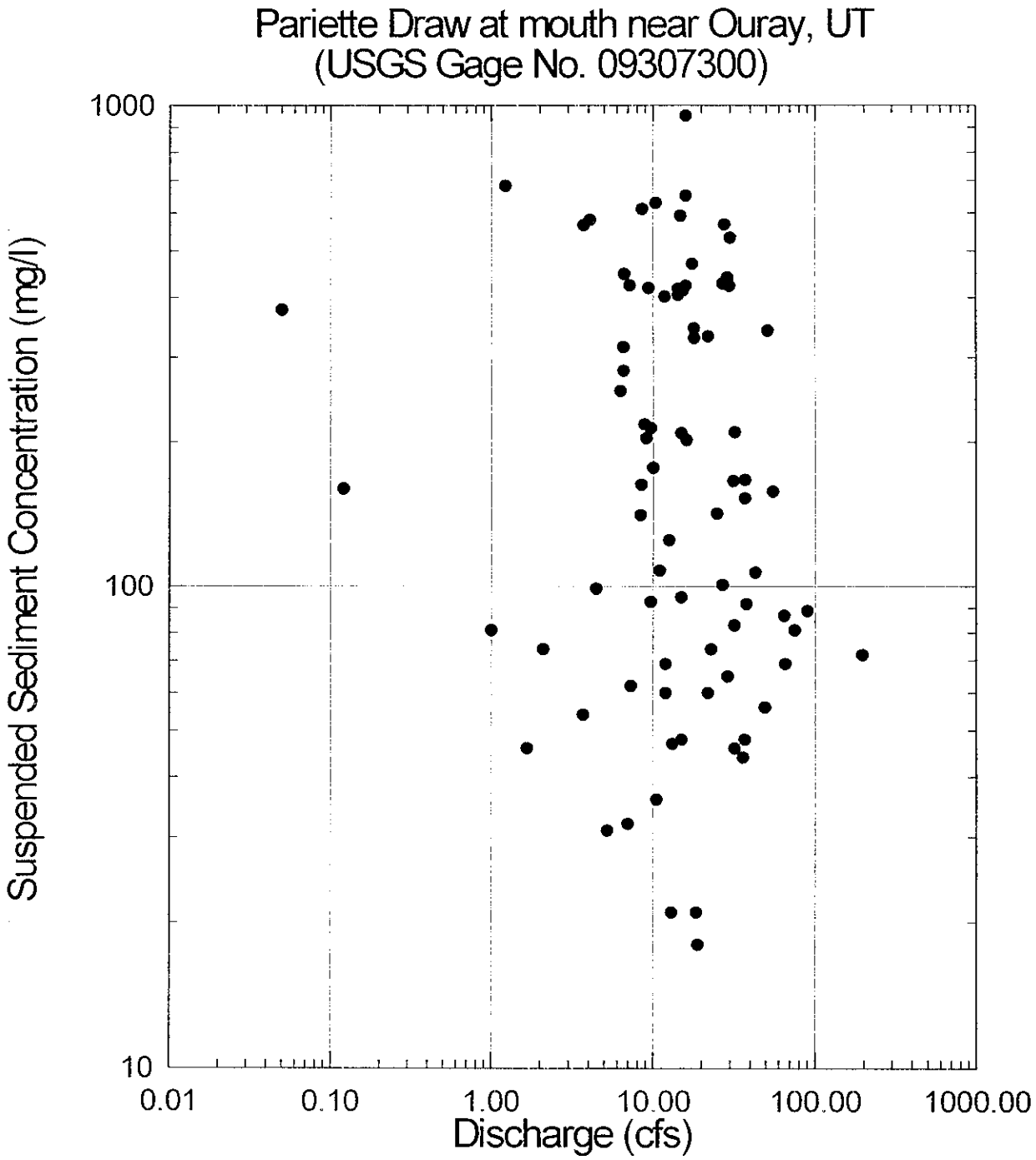

Red Creek near Dutch John, UT
(USGS Gage No. 09234700)
Suspended Sediment Concentration (mg/l)
1000000
100000
10000
1000
100
1
10
100
1000
Discharge (cfs)

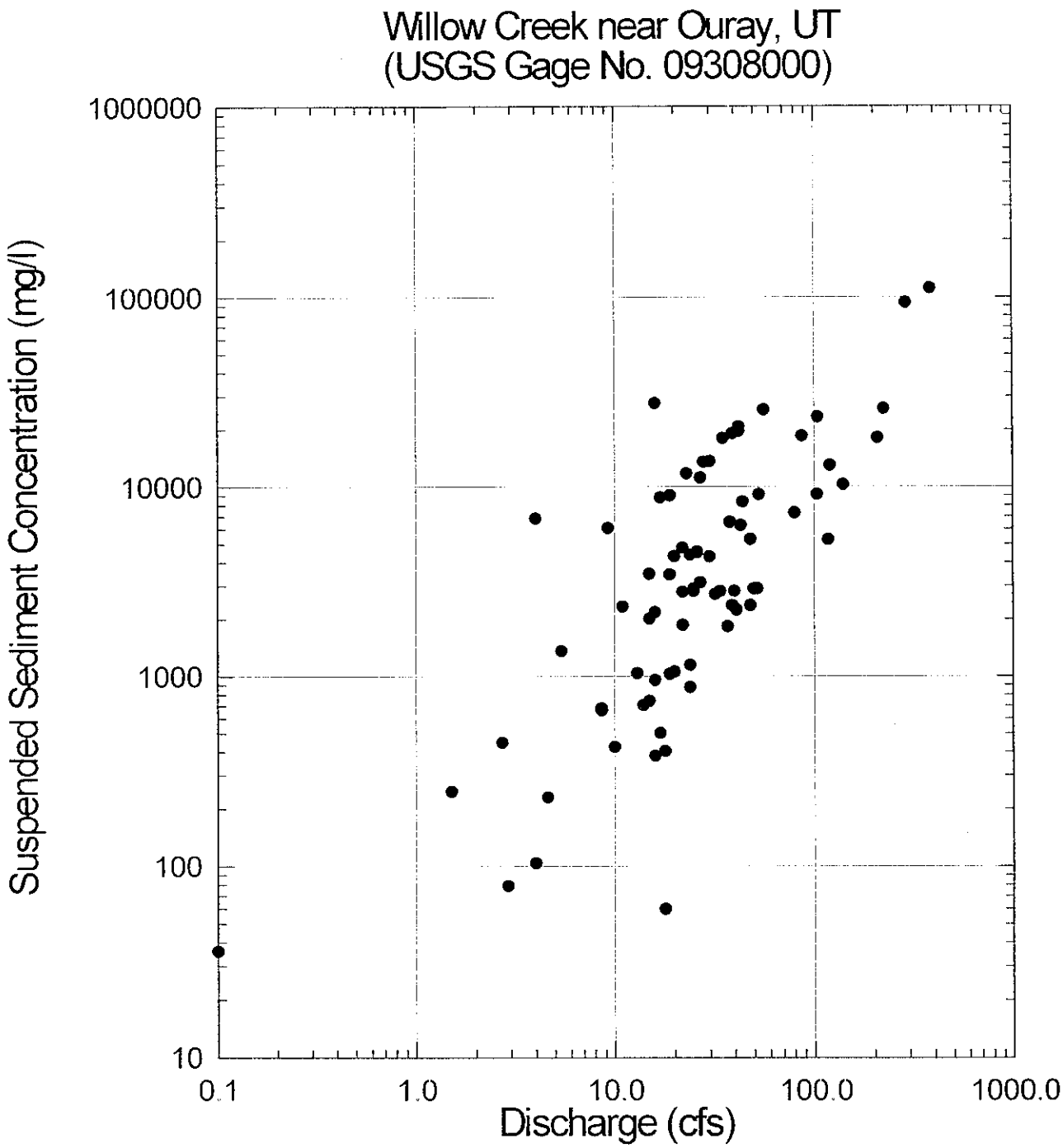

Green River near Jensen, UT
(USGS Gage No. 09261000)
Suspended Sediment Concentration (mg/l)
100000
10000
1000
100
10
1
100
1000
10000
100000
Discharge (cfs)

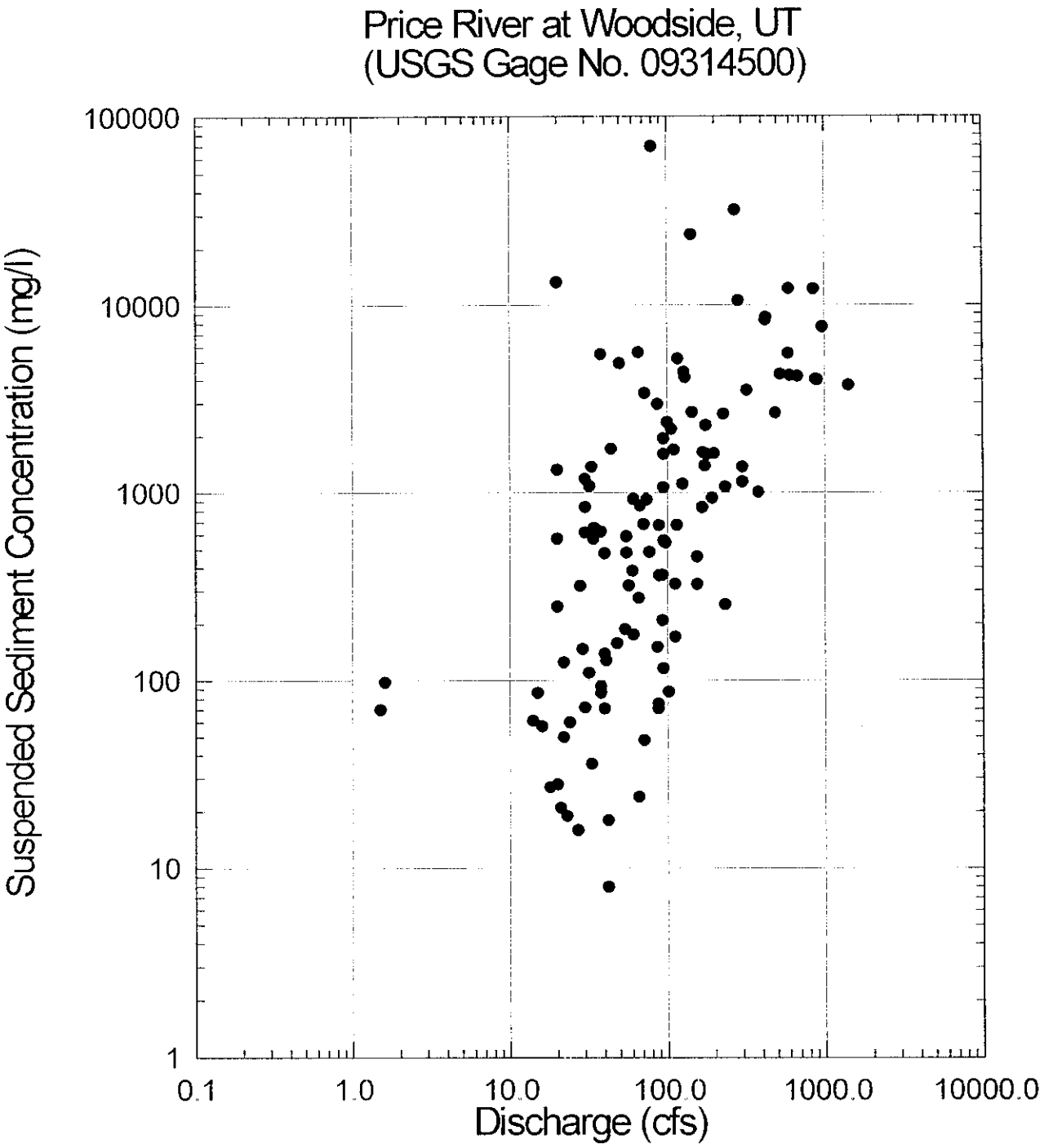

Duchesne River near Randlett, UT
(USGS Gage No. 09302000)
Suspended Sediment Concentration (mg/l)
10000
1000
100
10
1
10
100
1000
10000
100000
Discharge (cfs)

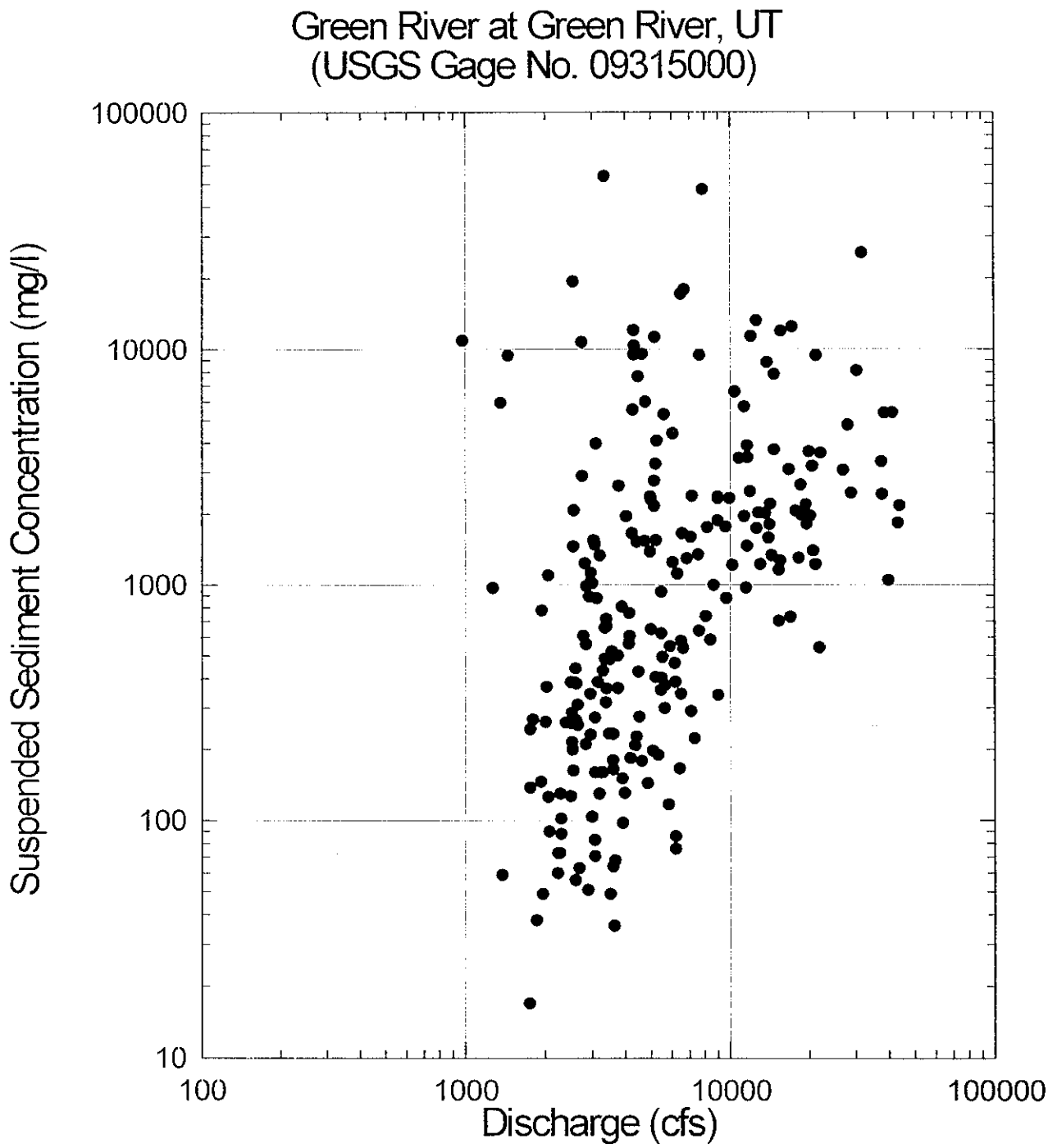

White River at mouth near Ouray, UT
(USGS Gage No. 09306900)
Suspended Sediment Concentration (mg/l)
100000
10000
1000
100
10
1
10
100
1000
10000
Discharge (cfs)

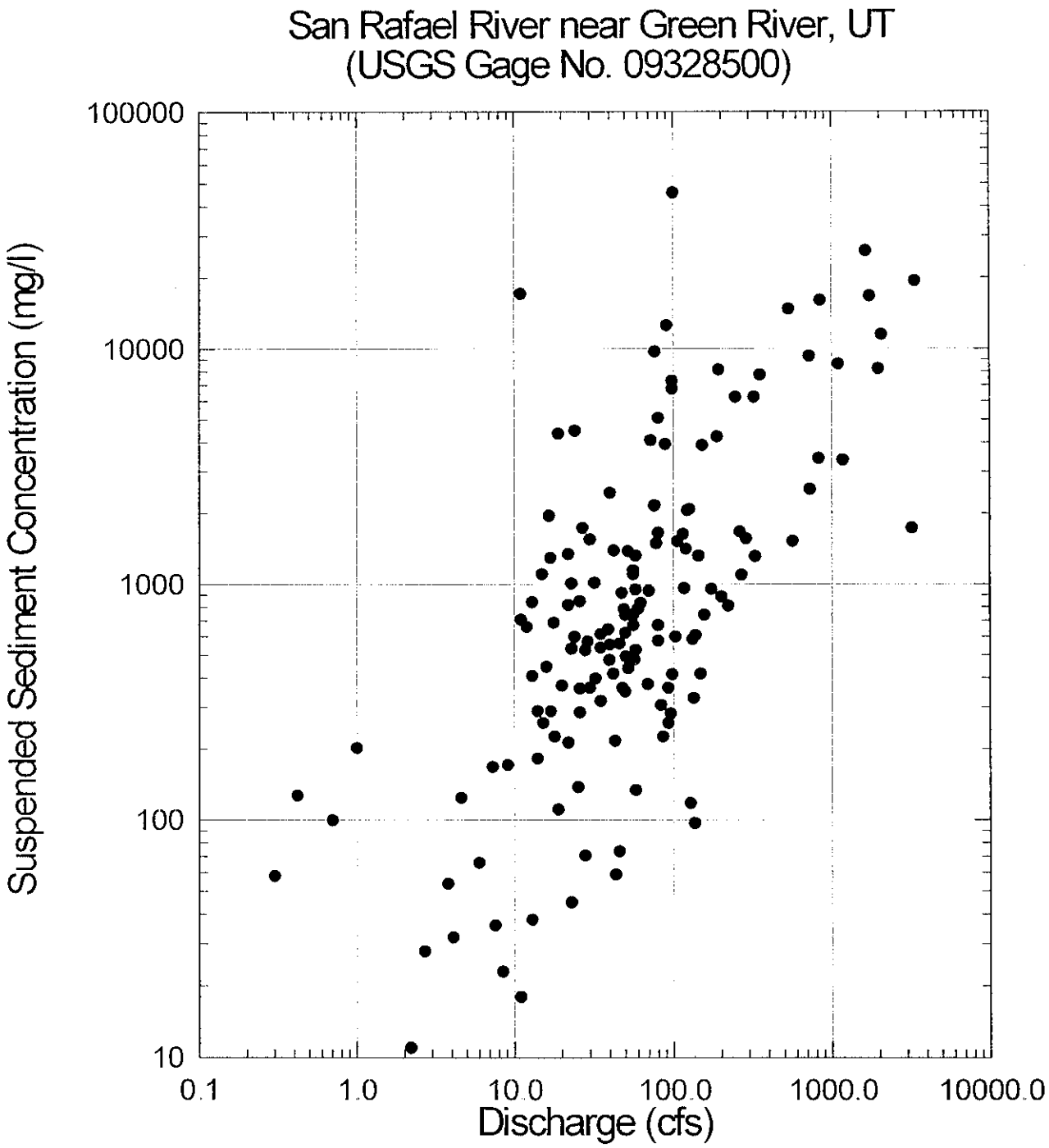

Green River near Ouray, UT
(USGS Gage No. 09307000)
Suspended Sediment Concentration (mg/l)
100000
10000
1000
100
10
100
1000
10000
100000
Discharge (cfs)


Pariette Draw at mouth near Ouray, UT
(USGS Gage No. 09307300)
Suspended Sediment Concentration (mg/l)
1000
100
10
0.01
0.10
1.00
10.00
100.00
1000.00
Discharge (cfs)


Willow Creek near Ouray, UT
(USGS Gage No. 09308000)
Suspended Sediment Concentration (mg/l)
1000000
100000
10000
1000
100
10
0.1
1.0
10.0
100.0
1000.0
Discharge (cfs)


Price River at Woodside, UT
(USGS Gage No. 09314500)
Suspended Sediment Concentration (mg/l)
100000
10000
1000
100
10
1
0.1
1.0
10.0
100.0
1000.0
10000.0
Discharge (cfs)


Green River at Green River, UT
(USGS Gage No. 09315000)
Suspended Sediment Concentration (mg/l)
100000
10000
1000
100
10
100
1000
10000
100000
Discharge (cfs)


San Rafael River near Green River, UT
(USGS Gage No. 09328500)
Suspended Sediment Concentration (mg/l)
100000
10000
1000
100
10
0.1
1.0
10.0
100.0
1000.0
10000.0
Discharge (cfs)

Inventory of Yampa River Data

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Number	Data in MEI Possession	Comments
Cleopatras Couch (RM 16.5)	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	sonar chart rec.	8		4 repeat measurements taken through the period
	July, 1991	O'Brien, FLO Eng	unpublished	survey	9		resurvey of 1983 XS-1 through XS-8, one new (XS-10)
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	survey	5	x	resurvey of XS-1 through XS-6
	August, 1995	Harvey and Mussetter, MEI	Harvey and Mussetter, 1996	survey	9	x	resurvey of XS-1 through XS-6, 3 new (XS-7 through XS-9)
Mathers Hole (RM 17.5)	May - August, 1982	O'Brien, CSU	O'Brien, 1982	sonar chart rec.	1		9 repeat measurements taken through the period
	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	stream gaging	1		same location as 1982 cross section
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	survey	14	x	XS-2 at location of O'Brien's 1982-83 cross section, additional topo of bar
	August, 1995	Harvey and Mussetter, MEI	Harvey and Mussetter, 1996	survey	12	x	resurvey of XS-1 through XS-12
Alternate Bar Study Site (RM 18.5)	July and August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	sonar chart rec	5		3 repeat measurements taken through the period
	July, 1991	O'Brien, FLO Eng.	unpublished	survey	5		resurvey of 1983 cross sections
Deerlodge Park (RM 46)	mid 1980's	O'Brien, CSU	unpublished	unknown	~10		info from Ed Wick, pers. comm.
	1996	Cooper, CSU	unpublished	unknown	~10		repeat of O'Brien's surveys
USGS gage, Yampa River near Maybell	n/a	Andrews, USGS	Andrews, 1980	survey	3 to 5		cross sections measured in self formed reach in vicinity of gage
Harding Hole to Outlaw Park	n/a	O'Brien, CSU	O'Brien, 1982	n/a	18		
USGS gage, Little Snake River near Lily	n/a	Andrews, USGS	Andrews, 1980	survey	3 to 5		cross sections measured in self formed reach in vicinity of gage
	1994	Wick, NPS	unpublished	survey	6		cross sections set during base flow, repeat meas. after runoff
Little Snake River, u/s Powder Wash Rd.	1994	Wick, NPS	unpublished	survey	8		
Cross Mountain	1996	Vail, USGS	Vail, pers. comm.	survey	??		Limiting fish passage studies, WSPRO models
throughout Yampa system	1996	Maddox, Colo. Div. Wildlife	Maddox, pers. comm.	PHABSIM	??		Yampa River habitat characterization studies
		and USFWS					

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Data in MEI Possession	Comments
Cleopatras Couch (RM 16.5)	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	survey		waters edge at cross sections, 4 repeat measurements
	July, 1991	O'Brien, FLO Eng.	unpublished	survey		waters edge at cross sections?
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	survey	x	waters edge at cross sections?
	August, 1995	Harvey and Mussetter, MEI	Harvey and Mussetter, 1996	survey	x	waters edge at a discharge of 516 cfs
Mathers Hole (RM 17.5)	May - August, 1982	O'Brien, CSU	O'Brien, 1982	survey		water surface slope at cross section, 9 repeat measurements
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	survey	x	waters edge at a discharge of about 300 cfs
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	survey	x	1984 flood high water marks (peak discharge = 32,300 cfs)
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	survey	x	1993 flood high water marks (peak discharge = 17,600 cfs)
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	survey	x	slackwater flood deposits along left valley wall
	August, 1995	Harvey and Mussetter, MEI	Harvey and Mussetter, 1996	survey	x	waters edge at a discharge of 514 cfs
	August, 1995	Harvey and Mussetter, MEI	Harvey and Mussetter, 1996	survey	x	1995 flood high water marks (peak discharge = 18,300 cfs)
Alternate Bar Study Site (RM 18.5)	July and August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	survey		waters edge at cross sections, 3 repeat measurements
	July, 1991	O'Brien, FLO Eng.	unpublished	survey		waters edge at cross sections?
USGS gage, Yampa River near Maybell	n/a	Andrews, USGS	Andrews, 1980	survey		water surface slope over reach at least 20 channel widths in length
Harding Hole to Outlaw Park	n/a	O'Brien, CSU	O'Brien, 1982	survey		water surface slopes at surveyed cross sections
USGS gage, Little Snake River near Lily	n/a	Andrews, USGS	Andrews, 1980	survey		water surface slope over reach at least 20 channel widths in length

additional measurements data added by John Elliott

Location	Date(s)	Investigator(s) / Organization	Reference	Description	Method	Data in MEI Possession	Comments
Cleopatras Couch (RM 16.5)	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	IFIM at each XS	Price or Price pygmy		measurements repeated 4 times at 8 cross sections
	July, 1991	Mussetter and Harvey, RCE	Harvey et al. 1993	Discharge	Marsh-McBirney	x	1208 cfs (52 percent in left channel)
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	Discharge	Marsh-McBirney	x	301 cfs (61 percent in left channel)
	August, 1995	Harvey and Mussetter, MEI	Harvey and Mussetter, 1996	Discharge	Marsh-McBirney	x	516 cfs (57 percent in left channel)
Mathers Hole (RM 17.5)	May - August, 1982	O'Brien, CSU	O'Brien, 1982	Discharge	Price meter		measurements repeated 9 times
	April-August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	Discharge	Price meter?		15 additional measurements at same location as 1982
	April-August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	Discharge	staff gage		staff gage in place during field season. Q from S-Q with 24 meas.
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	Discharge	Marsh-McBirney	x	measured twice. Q = 300 cfs and Q = 350 cfs
	August, 1995	Harvey and Mussetter, MEI	Harvey and Mussetter, 1996	Discharge	Marsh-McBirney	x	at XS-12, Q=514 cfs
Alternate Bar Study Site (RM 18.5)	July and August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	IFIM at each XS	Price or Price pygmy		measurements repeated 3 times through the period
Yampa at Lily Park	May, June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	Discharge	Marsh-McBirney	x	3 measurements corresponding to sediment measurements
USGS gage, Little Snake River near Lily	May, June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	Discharge	Marsh-McBirney	x	3 measurements corresponding to sediment measurements

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Number	Data in MEI Possession	Comments
Cleopatras Couch (RM 16.5)	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	probe	??		measurements accross cross sections, 4 repeat measurements
	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	calibrated square	??		numerous measurements on bar
	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	??	??		numerous measurements on bar, surface and subsurface
	June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	photo grid	1	x	
	June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	bulk	1	x	
	July, 1991	Mussetter and Harvey, RCE	unpublished	Wolman Count	11	x	
	July, 1991	Mussetter and Harvey, RCE	unpublished	bulk	2	x	
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	Wolman Count	6	x	
	August, 1995	Harvey and Mussetter, MEI	Harvey and Mussetter, 1996	Wolman Count	6	x	
Mathers Hole (RM 17.5)	May - August, 1982	O'Brien, CSU	O'Brien, 1982	bulk	??		9 repeat measurements taken through the period
	June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	photo grid	1	x	
	July, 1991	Mussetter and Harvey, RCE	unpublished	Wolman Count	3	x	
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	Wolman Count	11	x	
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	bulk subsurface	5	x	
	August, 1993	Mussetter and Harvey, RCE	Mussetter and Harvey, 1994	bulk	1	x	flocc. mud
	August, 1995	Harvey and Mussetter, MEI	Harvey and Mussetter, 1996	Wolman Count	5	x	
Alternate Bar Study Site (RM 18.5)	July and August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	probe	??		measurements accross cross sections, 3 repeat measurements
	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	calibrated square	??		numerous measurements on bar
	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	??	??		numerous measurements on bar, surface and subsurface
	June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	photo grid	1	x	
	July, 1991	Mussetter and Harvey, RCE	unpublished	Wolman Count	4	x	
	July, 1991	Mussetter and Harvey, RCE	unpublished	bulk	3	x	
USGS gage, Yampa River near Maybell	n/a	Andrews, USGS	Andrews, 1980	bulk	6 to 10		
Deerlodge Park to Echo Park	July, 1991	Mussetter and Harvey, RCE	unpublished	Wolman Count	7	x	Samples collected along reach and not counted in totals
Deerlodge Park to Echo Park	July, 1991	Mussetter and Harvey, RCE	unpublished	bulk	3	x	for RM 16.5, RM 17.5, and RM 18.5
Deerlodge Park to Echo Park	September, 1982	Potter, UNM	Potter et al, 1983	bulk?	?	x	samples from sand bars and beaches which exhibit successful
							tamarisk seedling establishment
USGS gage, Little Snake River near Lily	n/a	Andrews, USGS	Andrews, 1980	bulk	6 to 10		
	1994	Wick, NPS	unpublished	??	??		info from Ed Wick, pers. comm.
Little Snake River, u/s Powder Wash Rd.	1994	Wick, NPS	unpublished	??	??		info from Ed Wick, pers. comm.

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Number	Data in MEI Possession	Comments
Mathers Hole (RM 17.5)	May - August, 1982	O'Brien, CSU	O'Brien, 1982	3" Helley-Smith	9		24 measurements accross section
	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	3" Helley-Smith	42		10-foot verticals accross section
Yampa at Lily Park	May, June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	3" Helley-Smith	3	x	
USGS gage, Little Snake River near Lily	Summer, 1982	O'Brien, CSU	O'Brien, 1982	??	1		sample collected by John Elliott, USGS
	May, June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	3" Helley-Smith	3	x	

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Number	Data in MEI Possession	Comments
Mathers Hole (RM 17.5)	May - August, 1982	O'Brien, CSU	O'Brien, 1982	US D-49	9		24 measurements across section
	April - August, 1983	O'Brien, CSU	O'Brien, 1984a and 1984b	USGS D-74	39		10-foot verticals across section
Yampa at Lily Park	May, June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	USGS DH-49	3	x	
USGS gage, Little Snake River near Lily	May, June, 1989	Resource Consultants, Inc.	Resource Consultants, 1991	USGS DH-49	3	x	

Inventory of Green River Data

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Number	Data in* MEI Possession	Comments
Anderson Bottom-Bonita Bend	April - Sept., 1995	FLO Engineering	FLO Engineering, 1996	survey?	22	plots	3 sets during period; additional surveying of off-channel backwater habitat
(RM 25.3 - RM 34.5)							
Unknown Bottom (RM 28.5 - RM 31.3)	1992	Harvey and Mussetter, RCE	RCE, 1992	survey, fathometer	8	plots	Horizontal and vertical relationships between cross sections estimated
							from topo map.
Cottonwood Bottom (RM 55 - RM 56)	1980, 1992	USFWS	RCE, 1992	survey	6	plots	IFIM in 1980 surveyded and tied together in 1992. Surveyed in 1992 3 times
	1995	Kendall, USU	unpublished ?	survey	9	x	resurvey of USFWS cross sections, 3 new sections
Desolation and Gray Canyons	1996?	Schmidt, USU	Schmidt et al, 1996	??	??		cross sections measured at different discharges
(RM 132 - RM 216)							
Three Fords West (RM 155)	October, 1993	Harvey/Mussetter, RCE	Harvey and Mussetter, 1994	survey	8	x	additional topo of bars and downstream alluvial fan
Downstream of Willow Cr. (RM 239)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	Discharge meas.	1		repeated 16 times
Ouray NWR (RM 248 - RM 255)	March - Sept., 1995	FLO Engineering	FLO Engineering, 1996	survey?	35	plots	3 sets during period
	1996	FLO Engineering	FLO Engineering, 1997a	survey?	38	plots	measurement before and during runoff; resurvey of 1995 cross sections
							plus two new cross sections
Ouray NWR (RM 255)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	Discharge meas.	1		repeated 18 times
	July 1986 - Sept. 1987	Andrews/Nelson, USGS	Andrews and Nelson, 1989	survey	10		repeated 5 times
	1992, 1993	Rakowski/Schmidt, USU	Rakowski and Schmidt, 1996	survey	12	plots	6 of Andrews and Nelsons' sections resurveyed plus 6 new sections
							Also, topo of bar in 1994 that was surveyed by Krider in 1993
	1996	Guensch/Schmidt, USU	Guensch and Schmidt, 1996	survey	??		repeat of 1993 and 1994 cross sections; topo data
BLM Bottomland (RM 288 - 290)	1996	FLO Engineering	FLO Engineering, 1997a	survey?	20	plots	measurement before and during runoff; also topo of individual sites
Escalante wetlands - Razorback	spring-summer, 1993	FLO Engineering	FLO Engineering, 1993	survey/sonar depth	23		cross sections monitored during period
spawning bar (RM 304 - RM 312)							
near Dinosaur Quarry (RM 306)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	Discharge meas.	1		repeated 15 times
Dinosaur Nat. Mon. (RM 320 - RM 365)	summer, 1977	Graf, Univ. of Arizona	Graf, 1980	??	??		field measurements to support study on rapids.
	1994	Grams/Schmidt, USU	Grams and Schmidt, in press?	survey & depth sound	67		cross sections at 1 km intervals; surveyed at least twice since

* x - MEI has numerical data
plots - MEI only has plots

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Data in* MEI Possession	Comments
Green River, WY to Green River, UT	July - Sept., 1922	Woolley, USGS	Woolley, 1922			boat trip and survey
Anderson Bottom-Bonita Bend	April - Sept., 1995	FLO Engineering	FLO Engineering, 1996	survey	plots	bed and water surface from cross section surveys
(RM 25.3 - RM 34.5)						
Cottonwood Bottom (RM 55 - RM 56)	1992	USFWS	RCE, 1992	survey		bed and water surface from cross section surveys
Three Fords West (RM 155)	October, 1993	Harvey/Mussetter, RCE	Harvey and Mussetter, 1994	survey	x	bed and water surface from cross section surveys (Q = 2,100 cfs)
	October, 1993	Harvey/Mussetter, RCE	Harvey and Mussetter, 1994	survey	x	high water marks from 1995 runoff peak (25,300 cfs)
Downstream of Willow Cr. (RM 239)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	survey?		water surface slope measured at time of discharge measurements
Ouray NWR (RM 248 - RM 265)	March - Sept., 1995	FLO Engineering	FLO Engineering, 1996	survey	plots	bed and water surface from cross section surveys
	1996	FLO Engineering	FLO Engineering, 1997a	survey	x	profiles from cross section surveys; stages documented through the runoff season
Ouray NWR (RM 255)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	survey?		water surface slope measured at time of discharge measurements
Ouray NWR (RM 256)	July 1986 - Sept. 1987	Andrews/Nelson, USGS	Andrews and Nelson, 1988	survey		water surface and bed from cross section surveys
	1992 - 1994	Rakowski/Schmidt, USU	Rakowski and Schmidt, 1996	survey		water surface and bed from cross section and topo surveys
BLM Bottomland (RM 268 - 290)	1996	FLO Engineering	FLO Engineering, 1997a	survey	x	profiles from cross section surveys; stages documented through the runoff season
Escalante wetlands - Razorback	spring-summer, 1993	FLO Engineering	FLO Engineering, 1993	survey		bed and watersurface elevations as part of cross section survey
spawing bar (RM 304 - RM 312)						
near Dinosaur Quarry (RM 308)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	survey?		water surface slope measured at time of discharge measurements

* x - MEI has numerical data
plots - MEI only has plots

Location	Date(s)	Investigator(s) / Organization	Reference	Description	Method	Data in MEI Possession	Comments
Anderson Bottom-Bonita Bend	June 4,1995	FLO Engineering	FLO Engineering, 1996	Discharge	??		measured flow of 20,630 cfs sited in report
(RM 25.3 - RM 34.5)							
Canyonlands (RM 32.5)	1995/1996	FLO Engineering	FLO Engineering, 1997b	Discharge	flow measurements	measured	5 measurements at two sites
					& level logger	discharges	
Three Fords West (RM 155)	October, 1993	Harvey/Mussetter, RCE	Harvey and Mussetter, 1994	Discharge	Marsh-McBirney	x	gaging to determine flow distribution around bars
							(total discharge = 2,100 cfs)
Desolation Canyon (RM 160)	1996	FLO Engineering	FLO Engineering, 1997b	Discharge	flow measurements	measured	4 measurements
					& level logger	discharges	
Downstream of Willow Cr. (RM 239)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	Discharge	Marsh-McBirney		
Below White River (RM 246)	1996	FLO Engineering	FLO Engineering, 1997b	Discharge	flow measurements	measured	5 measurements
					& level logger	discharges	
Ouray NWR (RM 248 - RM 265)	1996	FLO Engineering	FLO Engineering, 1997a	Discharge	??	Q	5 measurements through r/o season
Ouray NWR (RM 255)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	Discharge	Marsh-McBirney		
Ouray NWR (RM 255.5)	1996	FLO Engineering	FLO Engineering, 1997b	Discharge	flow measurements	measured	5 measurements
					& level logger	discharges	
Ouray NWR (RM 256)	July 1986 - Sept. 1987	Andrews/Nelson, USGS	Andrews and Nelson, 1988	Discharge	??		repeated 5 times
Escalante wetlands - Razorback	spring-summer, 1993	FLO Engineering	FLO Engineering 1993	Discharge	Price meter		only a few measurements to determine flow around
spawing bar (RM 304 - RM 312)							spawning bar
near Dinosaur Quarry (RM 308)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	Discharge	Marsh-McBirney		
Mitten Park (RM 343)	1996	FLO Engineering	FLO Engineering, 1997b	Discharge	flow measurements	measured	4 measurements
					& level logger	discharges	

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Number	Data in MEI Possession	Comments
Flaming Gorge to mouth	??	Andrews, USGS	Andrews, 1986	??	??		based on discussion of grain size variation along reach
Anderson Bottom-Bonita Bend	April - Sept., 1995	FLO Engineering	FLO Engineering, 1996	bulk	7	x	
(RM 25.3 - RM 34.5)							
Three Fords West (RM 155)	October, 1993	Harvey/Mussetter, RCE	Harvey and Mussetter, 1994	Wolman Count	4	x	
				bulk	3	x	subsurface material
Downstream of Willow Cr. (RM 239)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	BHM-60	??		
Ouray NWR (RM 248 - RM 265)	March - Sept., 1995	FLO Engineering	FLO Engineering, 1996	bulk	17	x	
Ouray NWR (RM 255)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	BHM-60	??		
	July 1986 - Sept. 1987	Andrews/Nelson, USGS	Andrews and Nelson, 1988	??	??		measurements repeated 5 times as part of repeat surveys
Escalante wetlands - Razorback	spring-summer, 1993	FLO Engineering	FLO Engineering, 1993	bulk	~30	some in rpt.	
spawing bar (RM 304 - RM 312)							
near Dinosaur Quarry (RM 308)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	BHM-60	??		
Dinosaur Nat. Mon. (RM 320 - RM 365)	summer, 1977	Graf, Univ. of Arizona	Graf, 1980	??	??		field measurements to support study on rapids,
							actual data collected unknown
	1994	Grams/Schmidt, USU	Grams and Schmidt, in press?	Wolman Count	18		samples at head of bars
				qualitative	67		wading and fathometer interpretation

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Number	Data in MEI Possession	Comments
Escalante wetlands - Razorback	spring-summer, 1993	FLO Engineering	FLO Engineering, 1993	3" Helley-Smith	20		
spawing bar (RM 304 - RM 312)							
USGS Gage, Green River near Jensen	1996?	USGS	Wick, pers. comm.	??	10		data collected for USFWS and NPS
(RM 316.5)							

Location	Date(s)	Investigator(s) / Organization	Reference	Method	Number	Data in MEI Possession	Comments
Downstream of Willow Cr. (RM 239)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	D-49	16		
Ouray NWR (RM 255)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	D-49	18		
Ouray NWR (RM 256)	July 1986 - Sept. 1987	Andrews/Nelson, USGS	Andrews and Nelson, 1988	??	??		data collection repeated 5 times
Escalante wetlands - Razorback	spring-summer, 1993	FLO Engineering	FLO Engineering, 1993	D-39	/ 20		
spawing bar (RM 304 - RM 312)							
near Dinosaur Quarry (RM 308)	1986-1988	Lyons, USBR	Lyons, 1989, 1992	D-49	15		
USGS Gage, Green River near Jensen	1996?	USGS	Wick, pers. comm.	??	10		data collected for USFWS and NPS
(RM 316.5)							

Inventory of Study Sites Provided by George Smith, USFWS

Inventory of PHABSIM, Channel Monitoring and Sediment Sites
Supplied by George Smith, U.S. Fish & Wildlife Service

Name	Year	Researcher	Location
Government Bridge	1984-85	Brewer	Above Government Bridge
Maybell	1980?	Prewitt	Near Maybell Bridge
Lily Park	1994-95	O'Brien/Wick	Lily Sand Reach
Little Snake Loop	1994-95	O'Brien/Wick	
Deerlodge Park	1980-?	O'Brien	
Cross Mt. Canyon	1980-?	Prewitt	Lower end of canyon
Juniper Canyon	1980-?	Prewitt	
Yampa Spawning Bar	1982-91	O'Brien	RM 16-18
Warm Springs		O'Brien	
Boxelder		Prewitt	
Ladore Canyon	1994-95	Schmidt	
Mitten Park	1987	Smith	
Island Park	1986-88	Rose Hawn	
Jensen Gage		USGS	
Boneyard	1987-88	Lyons Sed Study	
Razorback Bar	1993	O'Brien	
Escalante Ranch	1993	O'Brien	
Stewart Lake			
Ouray Refuge	1983	Nelson Andrews Sed Study	
Ouray Refuge	1985-86	Brewer	
Ouray Refuge	1987	Smith Lyons	
Ouray Refuge	1991	Rokouski/Schmidt	
Ouray Refuge	1995	O'Brien	
Tia Juana Bottom	1950-68		USGS Gage
Tia Juana Bottom	1987	Smith	
Willow Creek	1987-88	Lyons Sed Study	
Three Fords	1985	Brewer	
Three Fords West	1994	Harvey	
Green River Gage			
Mineral Bottoms	1982	Wagner	
Mineral Bottoms	1992	Smith	
Mineral Bottoms	1995	Schmidt/Tyler	
Boneta Bend	1995	O'Brien	

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