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1 Summary

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Introduction

The Grassland Bypass Project (GBP) completed its fifth year of operations on September 30, 2001. This annual report documents results from the monitoring efforts for the fifth year (water-year (WY) 2001). Information from the previous four years are included where appropriate. One function of the annual report is to document results from the multi-agency data collection effort. The report builds upon previous information allowing for the discernment of changes in environmental conditions over time.

During the year, the Data Collection and Reporting Team (DCRT) continued to meet and review project data and associated reports. The following reports were reviewed and published during the final program year: monthly reports (12), quarterly data reports (4), graphical and narrative summaries (4), and the 4th annual report.

This annual report consists of technical chapters prepared by the agency staff responsible for their data collection effort within the GBP monitoring program.

Project Authorization

The U.S. Bureau of Reclamation (USBR) signed a Finding of No Significant Impact (FONSI) on November 3, 1995 for use of a 28-mile segment of the San Luis Drain (SLD) (USBR, 1995). This segment conveys agricultural drainage waters from the Grassland Drainage Area (GDA) to the San Joaquin River via a 6-mile segment of Mud Slough (North). A map of the GBP area and a schematic diagram are presented in Figures 1 and 2. Analysis from an environmental assessment (EA) dated April 1991, and supplemented in November 1995, resulted in the FONSI.

A Use Agreement (UA) was also signed on November 3, 1995 between USBR and the San Luis & Delta-Mendota Water Authority (SLDMWA) (USBR and SLDMWA, 1995). The UA provided the terms and conditions for the use of the SLD. The UA allowed for renewal of the interim two-year use for no more than three years if certain conditions were met. On January 25, 1999, the Oversight Committee recommended that the UA be extended until September 30, 2001.

The EA documents commitments made by participating agencies to address environmental benefits and risks. These commitments include the following:

- To ensure that progress continues toward long term resolution of agricultural subsurface drainage management activities,

- To ensure that there are no significant adverse effects to fish and wildlife, other environmental resources, and public health, and
- To ensure that the above listed commitments are implemented and addressed as part of the Project.

The EA also documented benefits and risks. The benefits include the following:

- Agricultural subsurface drainage water is removed from the Grassland Water District (GWD) delivery channels allowing refuge managers to receive and apply all of their fresh water allocations according to optimum habitat management schedules.
- Removal of agricultural subsurface drainage water from the GWD channels reduces the selenium exposures to fish, wildlife, and humans in the wetland channels and Salt Slough.
- Combining agricultural subsurface drainage flows within a single concrete-lined structure allows for effective concentrated monitoring leading to detailed evaluation and effective understanding of drainage flows and associated selenium loads.
- The establishment of an accountable drainage entity provides the framework necessary for responsible watershed management in the Grassland Basin.

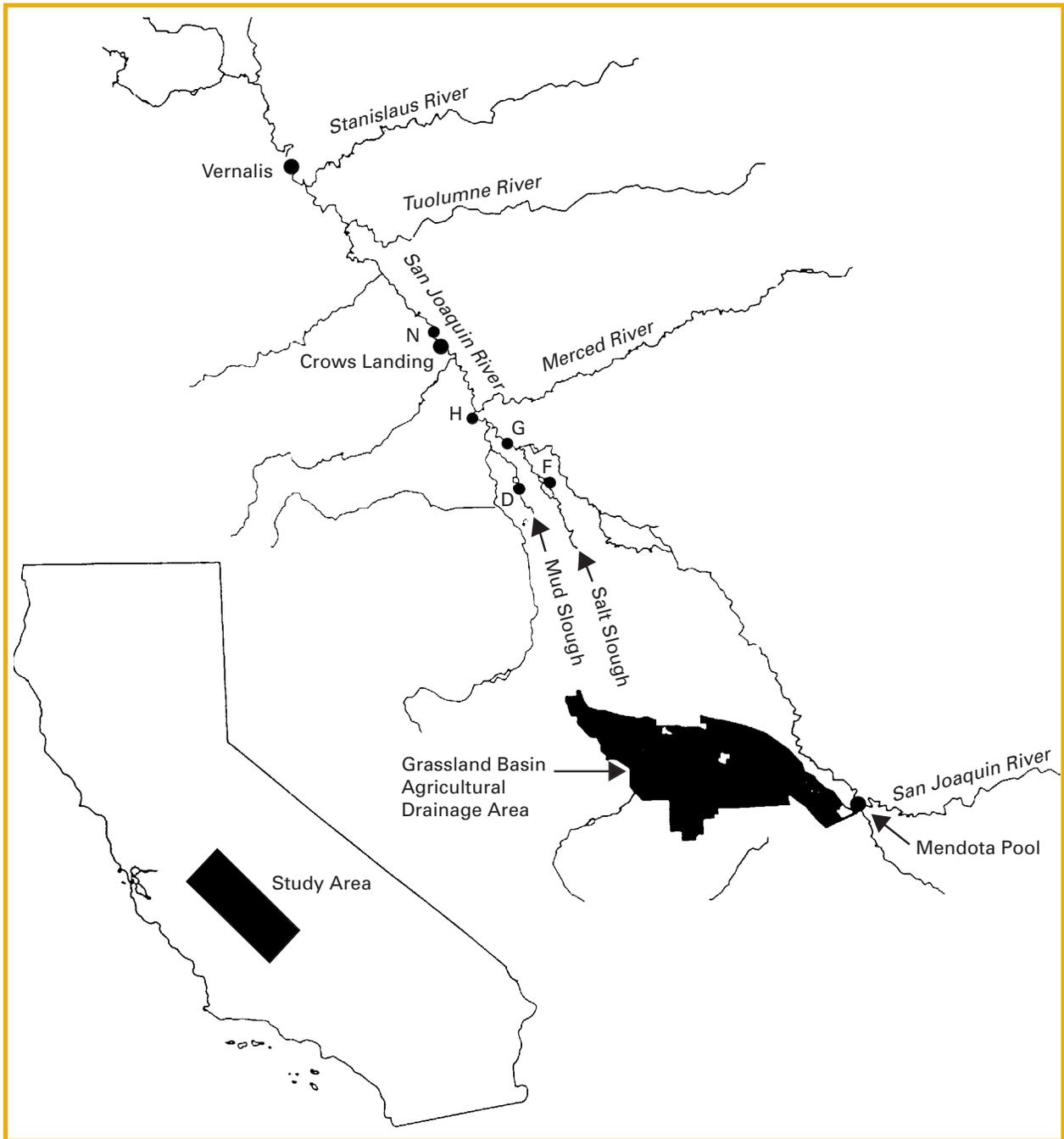
The documented risks included the following:

- Combining agricultural drainage flows within the SLD results in an increase in selenium and other constituents which are discharged into Mud Slough (North). These constituents will be above the levels historically discharged to Mud Slough (North) and could have an adverse environmental effect on six miles of Mud Slough (North).
- Agricultural drainage flows will enter wetland channels during floods.

2000-2001 Highlights

During water year 2001, monthly selenium loads discharged from the terminus of the SLD were all below the load values agreed upon in the UA (Figure 3a, Tables 1 and 2). The annual discharge amount, 4,377 pounds, was 23 per cent below the annual load value, 5,661 pounds. For comparison purposes, monthly discharges are also provided for water years 1997, 1998, 1999 and 2000 (Figures 3b, c, d and e).

Figure 1. Map of the Grassland Bypass Project



Completed Reports for the Continuation of the Grassland Bypass Project

1. Final Environmental Impact Statement and Environmental Impact Report for the Grassland Bypass Project, May 25, 2001
2. Biological Assessment, Grassland Bypass Project, 2001-2009, February 2001
3. Biological Opinion for the Grassland Bypass Project, September 27, 2001
4. Record of Decision, Grassland Bypass Project, September 28, 2001
5. Waste Discharge Requirements, No. 5-01-234 for San Luis & Delta Mendota Water Authority and the USBR, for the Grassland Bypass Project, September 21, 2001
6. Agreement for Use of the San Luis Drain, October 1, 2001 through December 31, 2009, September 28, 2001
7. Final Fish and Wildlife Coordination Act Report for the Grassland Bypass Project, December 28, 2001
8. Update of Long-Term Drainage Plan, December 31, 2001

Additional Reports/Studies

1. "Sources of Selenium" studies
Heavy rainfall during the first two Project years resulted in selenium load discharges exceeding load values. On-farm management activities were not able to control the excessive rainfall and associated storm runoffs through project boundaries. As a consequence, discharges through the San Luis Drain, and in some cases wetland channels, were above what were planned. The Oversight Committee recommended that additional studies be undertaken to establish the sources of selenium. Numerous studies are being worked on by the USGS, LBL, CVRWQCB, and USBR.
2. CVRWQCB draft staff reports
 - a. "Agricultural Drainage Contribution to Water Quality in the Grassland Watershed of the Western Merced, California, October 1999-September 2000 (WY2000)"
 - b. "Water Quality of the Lower San Joaquin River: Lander Avenue to Vernalis: October 1999 - September 2000 (WY 2000)" The two CVRWQCB technical reports document the water quality measurements for

WY 2000. Comparable annual data reports for have been published by the CVRWQCB since 1986.

Monitoring Program

The monitoring plan outlines the processes for collecting data to determine if the terms and conditions of the GBP are being met. Flow, water quality, sediment, biota, and toxicity data are collected to assess the Project impacts (Table 3). The data gathered from this effort allow evaluation of the degree to which the commitments of the UA, 1991 EA, 1995 Supplemental EA, FONSI, and Appendix A of the UA are being met.

Changes were made to the GBP monitoring program during the year. Those changes are documented within each of the following technical chapters. The major change included the relocating sampling Site I to I2 in March, 2001 (see Chapter 7 for details).

Water Quality Monitoring on the San Joaquin River at Hills Ferry

As reported in the 4th Annual Report, the CVRWQCB dropped the Hills Ferry water quality sampling station. Since the station is used for biological monitoring, an agreement was worked out between USFWS and SLDMWA to continue water quality monitoring in order to aid potential future development of revised criteria. The SLDMWA agreed to perform the

PARAMETER	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA
UNITS	µS/cm	µg/L	mg/L
Sep-01-2000	1,520	8.1	1.5
Sep-08-2000	1,580	8.2	1.8
Sep-13-2000	1,250	5.3	1
Sep-21-2000	1,560	6.9	1.3
Oct-04-2000	NT	5.3	NT
Oct-12-2000	1,010	2.6	0.8
Oct-18-2000	1,150	2.2	0.8
Oct-26-2000	1,310	2.4	0.9
Nov-02-2000	836	1.3	0.8
Nov-10-2000	1,410	4	1.1
Nov-12-2000	1,850	4.3	1.3
Nov-17-2000	1,760	4.4	1.3
Nov-22-2000	1,850	4.3	1.3
Nov-30-2000	1,820	4	1.4
Dec-08-2000	1,720	3.3	1.7
Dec-14-2000	1,780	3.3	1.3
Dec-21-2000	1,840	4.3	1.3
Dec-28-2000	2,000	4	1.5
Jan-04-2001	2,120	3.7	1.5
Jan-09-2001	1,830	3.4	1.3
Jan-16-2001	1,630	2.7	1.2
Jan-24-2001	2,020	3.6	1.5
Jan-30-2001	1,700	4.1	1.3
Feb-06-2001	2,150	6.3	1.6
Feb-13-2001	1,790	6.6	1.4
Feb-20-2001	2,020	7.6	1.6
Feb-27-2001	1,350	4.9	1
Mar-06-2001	1,360	4.3	1.1
Mar-13-2001	1,690	5.7	1.4
Mar-20-2001	2,210	8.1	1.9

Figure 2. Schematic Diagram Showing Locations of GBP Monitoring Sites Relative to Major Hydrologic Features of the Study Area

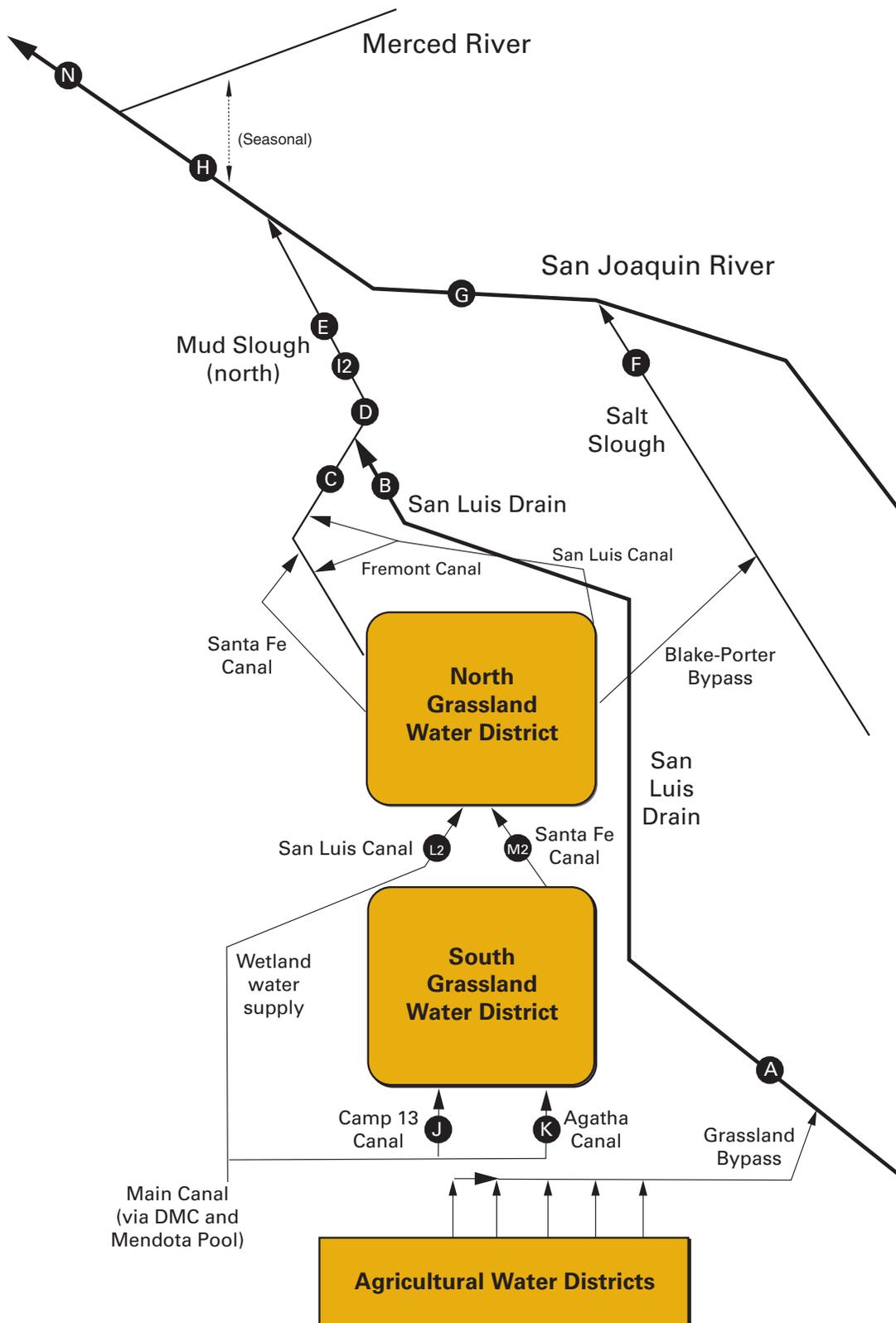


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PARAMETER	Specific Conductance	Selenium (total)	Boron
DATA SOURCE	SLDMWA	SLDMWA	SLDMWA
UNITS	µS/cm	µg/L	mg/L
Mar-27-2001	2,140	7.1	1.8
Apr-03-2001	2,430	9.6	1.9
Apr-11-2001	1,890	6	1.5
Apr-17-2001	2,290	8.7	1.6
Apr-24-2001	1,340	5.3	1
May-04-2001	2,770	10.5	1.9
May-08-2001	2,350	8	1.7
May-15-2001	1,610	6.2	1.3
May-22-2001	2,210	6.7	1.8
May-29-2001	2,000	7.9	1.6
Jun-05-2001	1,860	9.6	1.8
Jun-12-2001	2,570	12.4	2.6
Jun-19-2001	2,020	9.3	1.8
Jun-28-2001	1,740	8.4	1.7
Jul-06-2001	2,080	9.2	2.1
Jul-10-2001	1,960	10	2
Jul-17-2001	1,900	8.3	1.9
Jul-24-2001	1,750	8.9	1.7
Jul-31-2001	1,720	8.2	1.7
Aug-07-2001	1,950	9.9	2.1
Aug-14-2001	1,990	8.7	1.8
Aug-21-2001	1,700	7.1	1.6
Aug-28-2001	1,780	8.7	1.5
Sep-04-2001	2,200	10.4	1.8
Sep-11-2001	2,030	8.3	1.3
Sep-18-2001	2,350	7.5	1.4
Sep-25-2001	2,140	4.6	1.2
NT = not tested			

sampling. Starting in September 2000, the SLDMWA performed the weekly water quality sampling.

Listed below are the data for the 5th project year.

Project Organization

The GBP involves the coordination and cooperation of several State and Federal agencies whose authority, interests, or activities directly overlap in one or more aspects of the GBP. These agencies include USBR, USFWS, USGS, USEPA, CVRWQCB, CDFG and the SLDMWA. The latter organization includes local drainage and water districts that participate in the drainage activities. The Grassland Area Farmers (GAF) formed a regional drainage entity under the umbrella of the SLDMWA.

Oversight Committee (OC)

The Oversight Committee is comprised of senior level representatives from USBR, USFWS, CDFG, CVRWQCB, and USEPA. The role of the OC is to review process and assure performance of all operations of the GBP as specified in the Use Agreement, including

Figure 3a. Grassland Bypass Project Water Year 2001 Monthly Selenium Discharges into Mud Slough (Station B) Compared to Load Values

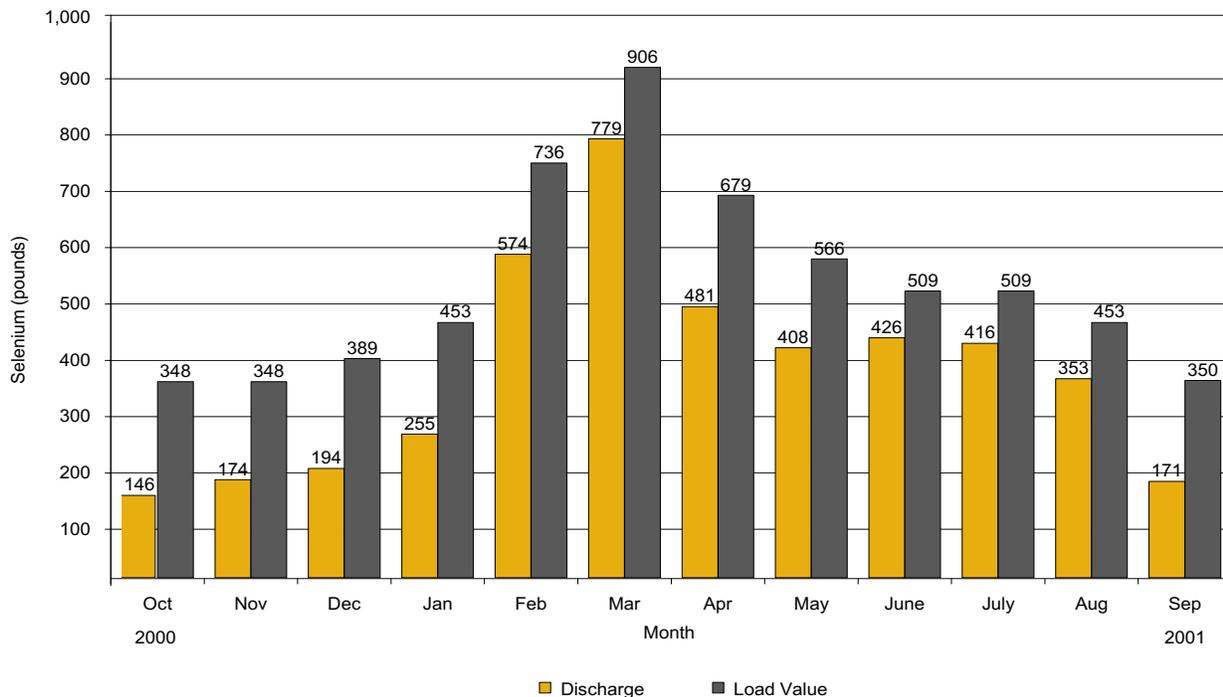


Figure 3b. Grassland Bypass Project Water Year 2000
Monthly Selenium Discharges into Mud Slough (Station B) Compared to Load Values

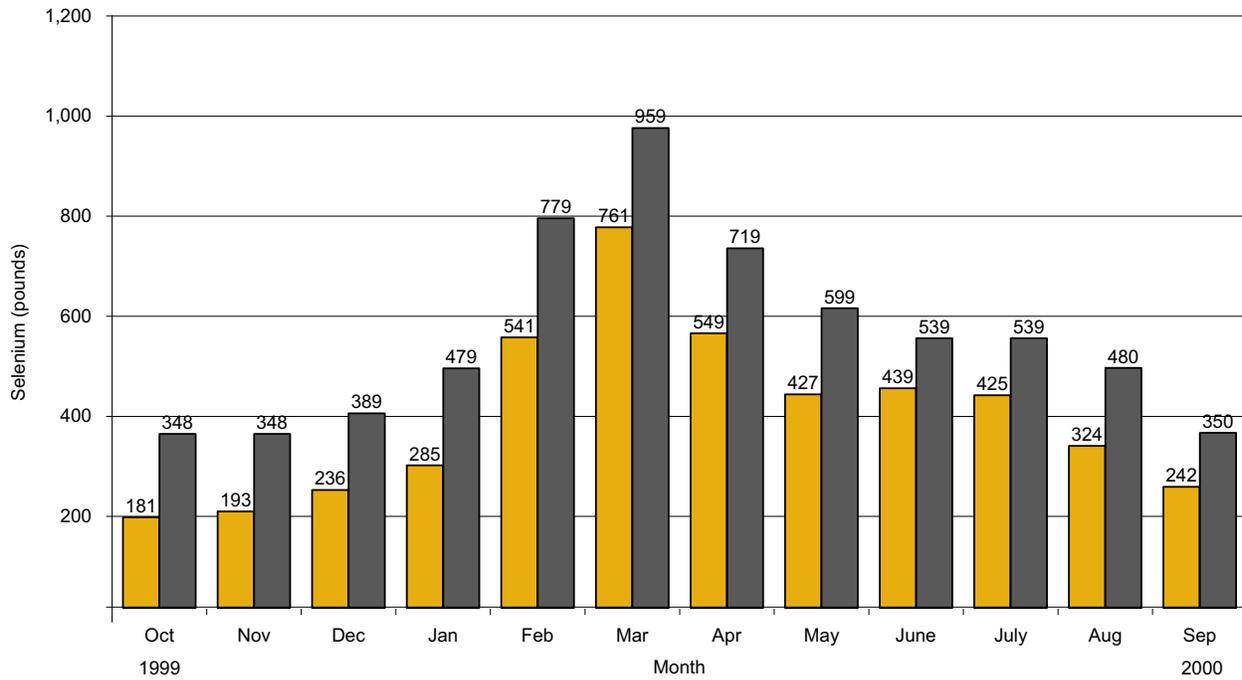


Figure 3c. Grassland Bypass Project Water Year 1999
Monthly Selenium Discharges into Mud Slough (Station B) Compared to Load Values

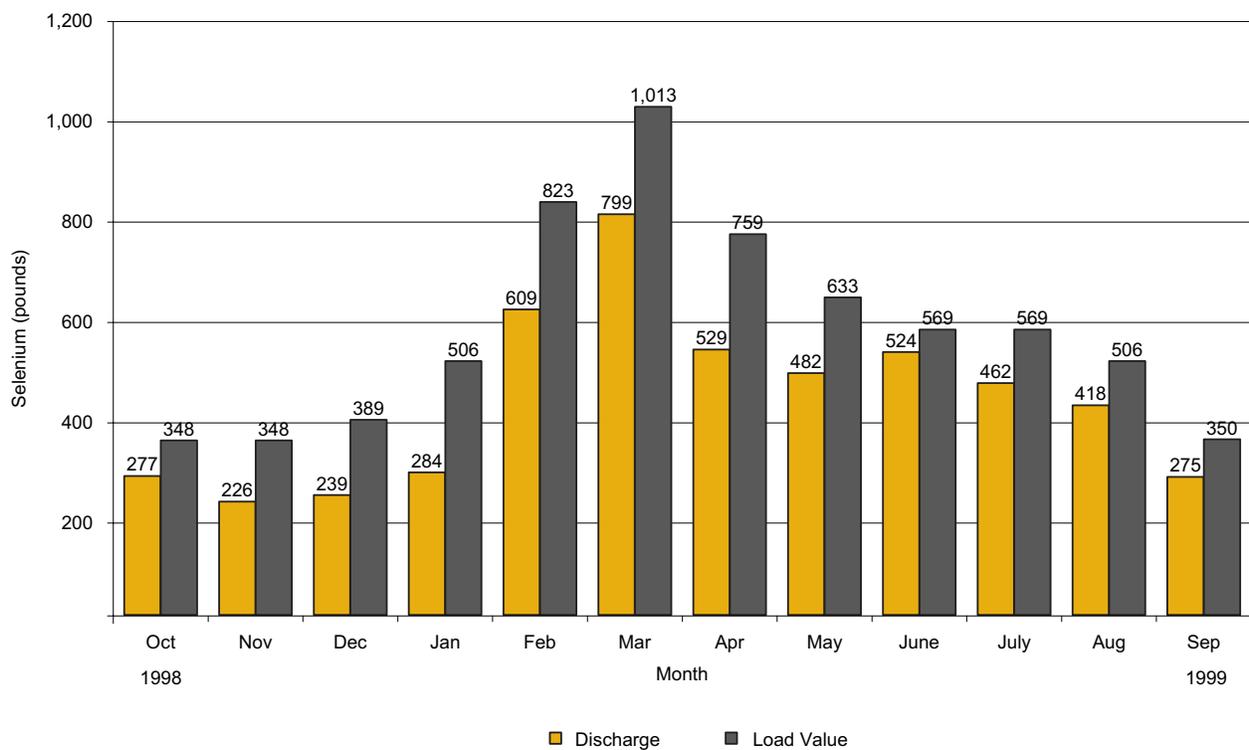
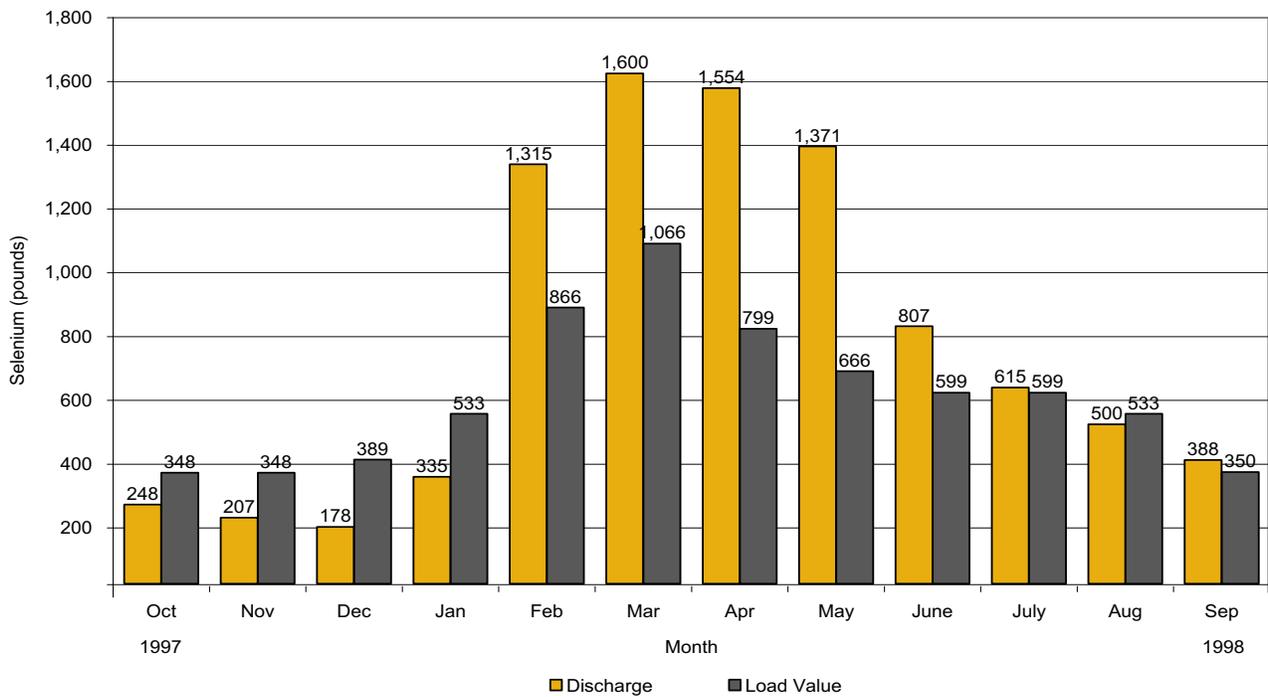
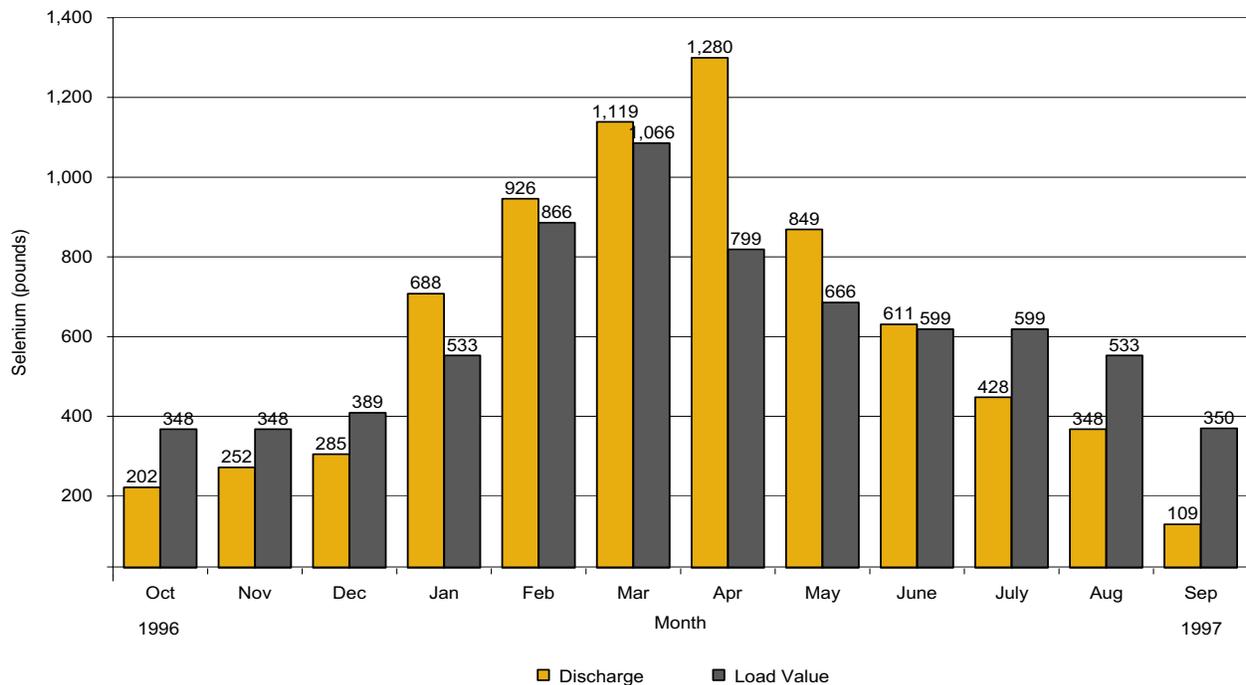


Figure 3d. Grassland Bypass Project Water Year 1998
Monthly Selenium Discharges into Mud Slough (Station B) Compared to Load Values



Note: February value includes 350 pounds of selenium discharged through wetland channels due to storm

Figure 3e. Grassland Bypass Project Water Year 1997
Monthly Selenium Discharges into Mud Slough (Station B) Compared to Load Values



Note: January value includes 89 pounds of selenium discharged through wetland channels due to storm events
 Note: February value includes 48 pounds of selenium discharged through wetland channels due to storm events

Table 1. Monthly Selenium Discharges into Mud Slough (Station B) Compared to Load Values, Pounds, Water Years 1997, 1998, 1999, 2000, 2001

Month	WY 2001 Discharge	Year 5 Load Values	WY 2000 Discharge	Year 4 Load Values	WY 1999 Discharge	Year 3 Load Values	WY 1998 Discharge	Year 2 Load Values	WY 1997 Discharge	Year 1 Load Values
October	146	348	181	348	277	348	248	348	202	348
November	174	348	193	348	226	348	207	348	252	348
December	194	389	236	389	239	389	178	389	285	389
January	255	453	285	479	284	506	355	533	688 **	533
February	574	736	541	779	609	823	1,315 *	866	926 ***	866
March	779	906	761	959	799	1,013	1,600	1,066	1,119	1,066
April	481	679	549	719	529	759	1,554	799	1,280	799
May	408	566	427	599	482	633	1,371	666	849	666
June	426	509	439	539	524	569	807	599	611	599
July	416	509	425	539	462	569	615	599	428	599
August	353	453	324	480	418	506	500	533	348	533
September	171	350	242	350	275	350	388	350	109	350
12-month total	4,377	NA	4,603	NA	5,124	NA	9,118	NA	7,097	NA
Annual load value	NA	5,661	NA	5,994	NA	6,327	NA	6,660	NA	6,660

* includes 350 pounds of selenium discharged through the wetland channels due to storm events

** includes 89 pounds of selenium discharged through the wetland channels due to storm events

*** includes 48 pounds of selenium discharged through the wetland channels due to storm events

Table 2. Grassland Bypass Project Selenium Load Levels (lbs)

Month	Year 1-2	Year 3	Year 4	Year 5
October	348	348	348	348
November	348	348	348	348
December	389	389	389	389
January	533	506	479	453
February	866	823	779	736
March	1,066	1,013	959	906
April	799	759	719	679
May	666	633	599	566
June	599	569	539	509
July	599	569	539	509
August	533	506	480	453
September	350	350	350	350
12-month total ¹	7,090	6,813	6,528	6,246
Annual load Levels	6,660 ²	6,327 ³	5,994 ⁴	5,661 ⁵

1. The 12-month total for any given year is somewhat higher than the annual load target for that year because the monthly targets for the months of September, October, November and December have been adjusted to allow for greater selenium discharge than would typically occur. This adjustment has been made to provide greater selenium management flexibility during months when the assimilative capacity of the river is sufficient to sustain this greater load.

2. The annual 2nd year load target is based on the average annual loads discharged over a 9-year historical period (1986-1994) which includes both wet and dry year data, as well as full and partial water supply data. It is divided by month based on the average historical distribution of selenium loads except where the Total Maximum Monthly Load (TMML) calculation (using a 1-in-5 month violation rate) allows for a greater monthly load.

3. The 3rd year annual load target is based on a 5% reduction of the average historical loads. The 5% reduction is applied equally across all months except where the TMML (using a 1-in-5 month violation rate) allows for greater monthly selenium loads.

4. The 4th year annual load target is based on a 10% reduction of the average historical loads. The 10% is applied equally across all months except where the TMML (using a 1-in-5 month violation rate) allows for greater monthly selenium loads.

5. The 5th year annual load target is based on a 15% reduction from the average historical load. The 15% is applied equally across all months, except where the TMML (using a 1-in-5 month violation rate) allows for greater monthly selenium loads.

Data Management

Each agency collecting data is responsible for its own internal data quality and management procedures. These are detailed in the QAPP. In addition, each agency submits its data to the San Francisco Estuary Institute (SFEI), which, through a cooperative agreement with USBR, compiles and reports project findings.

Reporting

The San Francisco Estuary Institute assembles, summarizes, and distributes monthly, quarterly and annual reports. Monthly and quarterly data reports consist of primary data from the 14 key monitoring stations as depicted in Table 3: SLD (A, B), Mud Slough (C, D, E, I), Salt Slough (F), wetland channels (J, K, L2, M2), and the San Joaquin River (G, H, N). The monthly report presents data collected during that particular month, including the calculated selenium load discharged at Station B, the terminus of the SLD. Quarterly data reports consist of all available data from all stations during a 3-month period. SFEI also prepares quarterly narrative and graphical summaries of the most recent Project data. The focus of SFEI is to report data and information from all sampling sites in a timely manner. All reports are distributed to the participating parties and are available to the public upon request.

A web site for the GBP provides current reports describing Project results. Also available are pre-Project information, related scientific studies, photographs of many of the stations, and other related topics. Visit the GBP web site by first connecting to USBR Mid-Pacific Region's home page at <http://www.mp.usbr.gov/> and then select projects and then select Grassland Bypass Project.

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