RECLAMATION
Managing Water in the West

Boise River Reservoir Operations

Treasure Valley CAMP Meeting
May 22, 2010

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U.S. Department of the Interior
Bureau of Reclamation

Boise River & Reservoir System

- Drainage area – 2650 square miles
- Provides water for full and supplemental irrigation to approx. 275,000 acres
- Electrical generation at Anderson Ranch, Arrowrock, Lucky Peak, and Boise Diversion Dam
- Flood operations in conjunction with Army Corps of Engineers
- Max. recorded discharge – 35,500 cfs, June 14, 1896

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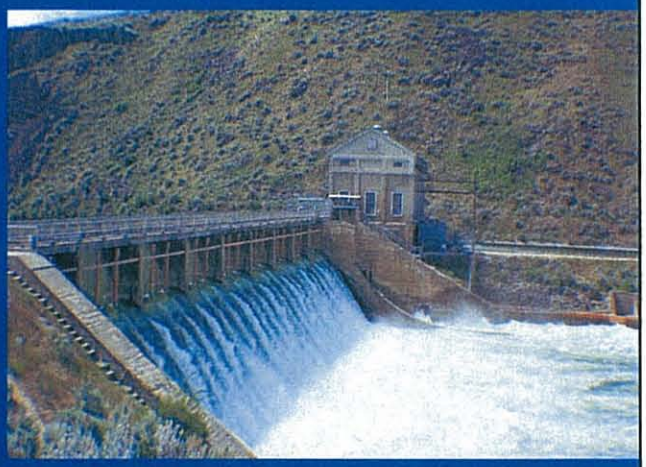
Boise River Diversion Dam

- Completed 1908 by USRS
- 68-ft high concrete and masonry dam
- Constructed to divert water into New York Canal and to provide power for Arrowrock construction
- Three 1100 kW generators



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Arrowrock Dam

- Completed 1915 by USRS
- 350-ft high thick- concrete arch dam
- 272,200 AF storage capacity
- Authorized for irrigation storage

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Anderson Ranch Dam

- Completed 1950 by USBR
- 456-ft high embankment dam
- 413,100 AF storage capacity
- Authorized for irrigation, power and flood control

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Lucky Peak Dam

- Completed 1954 by Army Corps of Engineers
- 340-ft high embankment dam
- 264,370 AF storage capacity
- Authorized for flood control and storage

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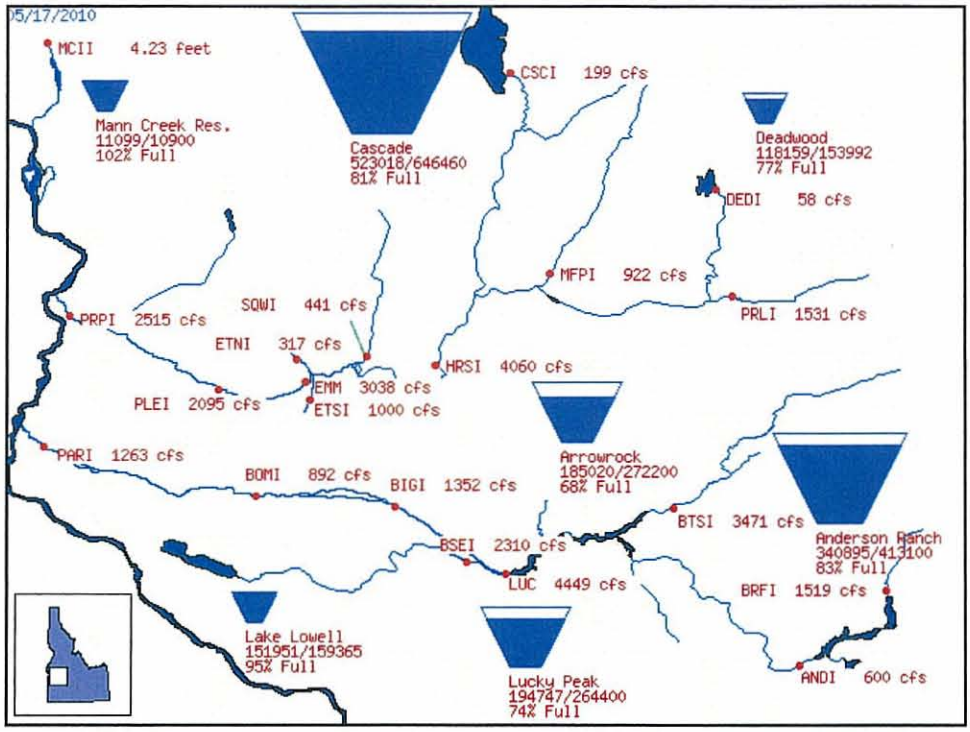

Boise River Reservoir Operations

- Primary objective is flood control
- Second objective is water supply storage
- Flood control operations primarily driven by runoff forecast
- Flood control operations dictated by Army Corps "rule curves" based on nearly 100 years of hydrologic record and current snowpack conditions

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Boise River Reservoir Operations (cont.)

- Irrigation operations primarily driven by irrigation demand
- Irrigation releases are ordered daily by the Boise River Water Master
- Reclamation works with the Corps of Engineers, Boise River Watermaster, and others to manage the reservoir system for multiple objectives

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Flood Control Operations

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Year	Date	Flow (cfs)
1983	30-May	24,255
1965	24-Dec	24,241
1997	2-Jan	24,052
1984	15-May	22,541
2006	20-May	22,065
1996	16-May	20,570
1975	16-May	20,438
1974	15-Jun	20,314
1971	13-May	19,996
1972	2-Jun	19,905
1982	27-May	19,020
1986	31-May	17,992
2008	19-May	17,208
1999	26-May	16,445
1993	15-May	16,339
2003	30-May	16,019
1967	24-May	15,843
1969	23-Apr	15,601
1970	27-May	15,032
2002	15-Apr	14,218
1998	27-May	14,186
1980	26-Apr	13,429
1964	22-May	13,428
1976	11-May	13,411
1995	12-May	13,350
Average Peak for 50-yr period		13,346

Peak Unregulated Flows into Boise Reservoir System (cfs)

7000 cfs = Flood Stage (regulated)

16,800 cfs = 100-year flood (regulated)

41,200 cfs = 100-year flood (unregulated)

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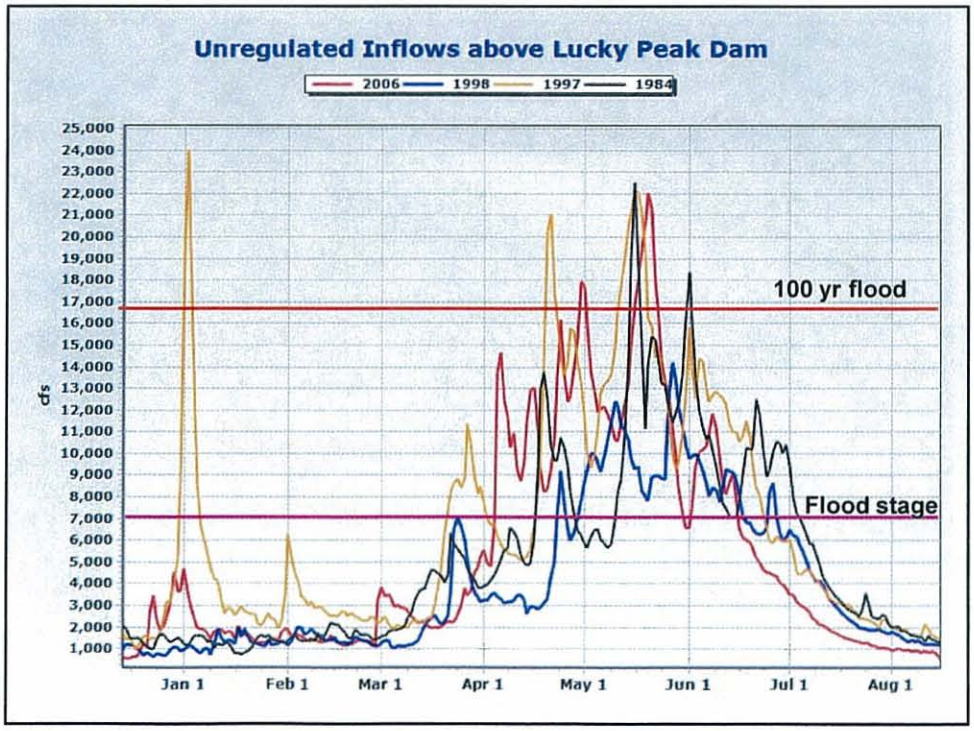

Year	Date	Flow (cfs)
1983	13-Jun	9560
1998	31-May	8350
1986	8-Jun	7960
1982	30-Jun	7410
1974	8-May	7380
1982	30-Jun	7350
1965	22-May	7170
1997	23-Mar	7160
2006	8-May	7050
1984	4-Jun	6900
2008	21-May	6860
1971	24-Apr	6850
1981	10-Jun	6830
1999	25-Mar	6770
1972	7-May	6730
1996	27-Mar	6690
1975	19-May	6680
1993	23-May	6560
1989	23-Apr	6130
2009	7-Jun	6040
1976	1-May	6030
1963	25-May	5870
1960	11-Apr	5710
1980	22-Jun	5620
1978	29-Apr	5460
Average Peak for 50-yr period		4,384

Peak Regulated Flows at Glenwood or Broadway Bridge Gauging Station

6500 cfs = Bank Full

7000 cfs = Flood Stage

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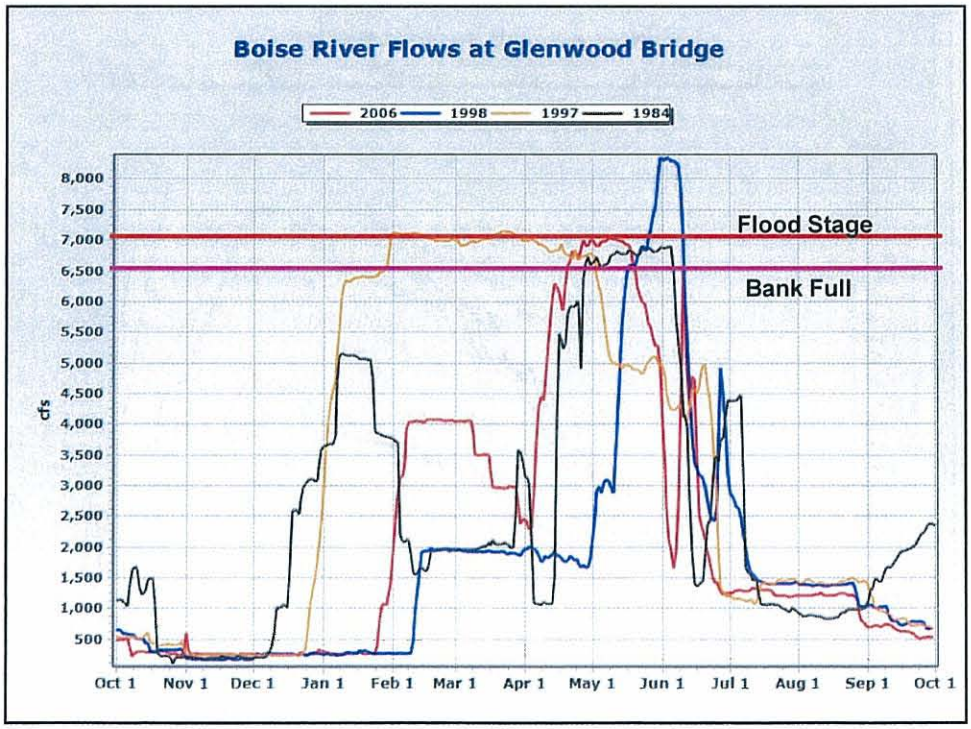

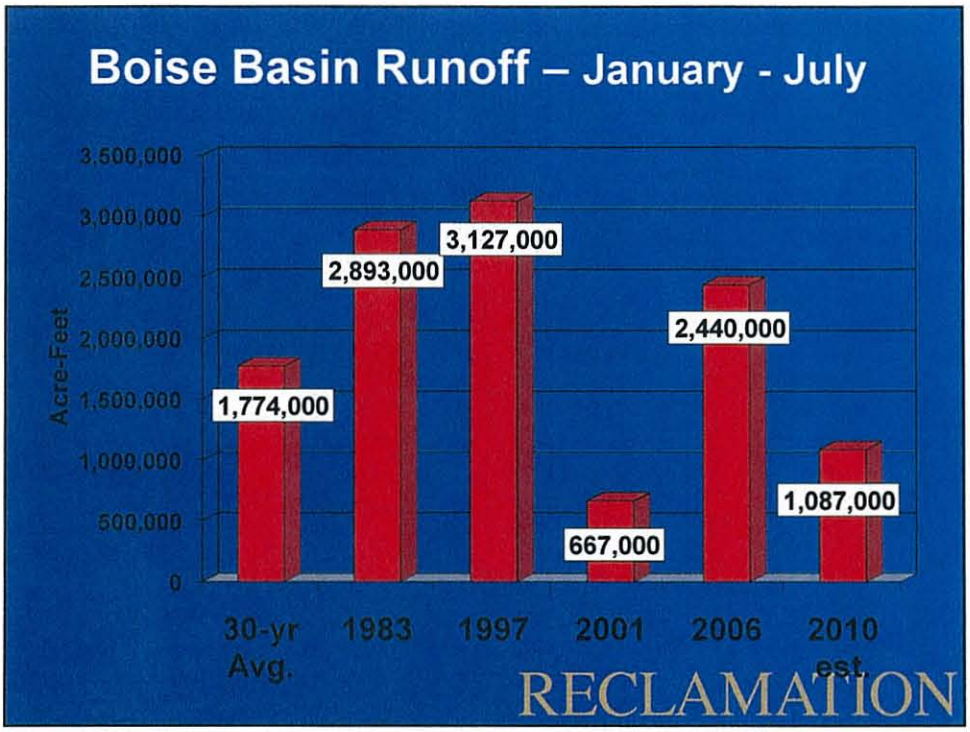
Boise Basin Runoff – January - July
Acre-Feet
3,500,000
3,000,000
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1,774,000
2,893,000
3,127,000
667,000
2,440,000
1,087,000
30-yr Avg.
1983
1997
2001
2006
2010 est.
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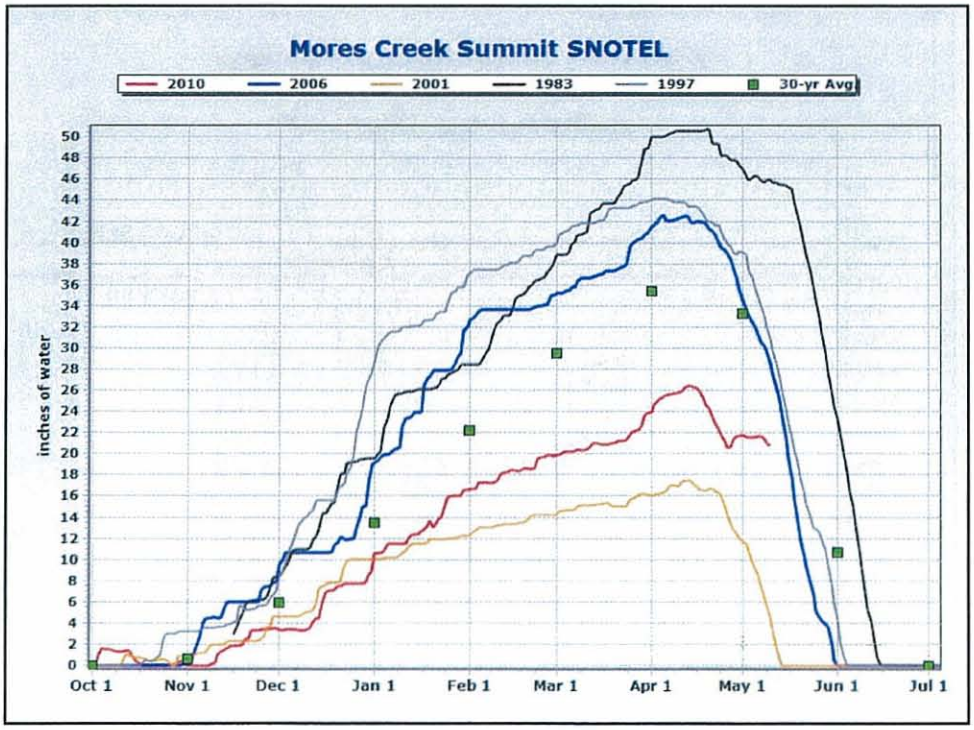
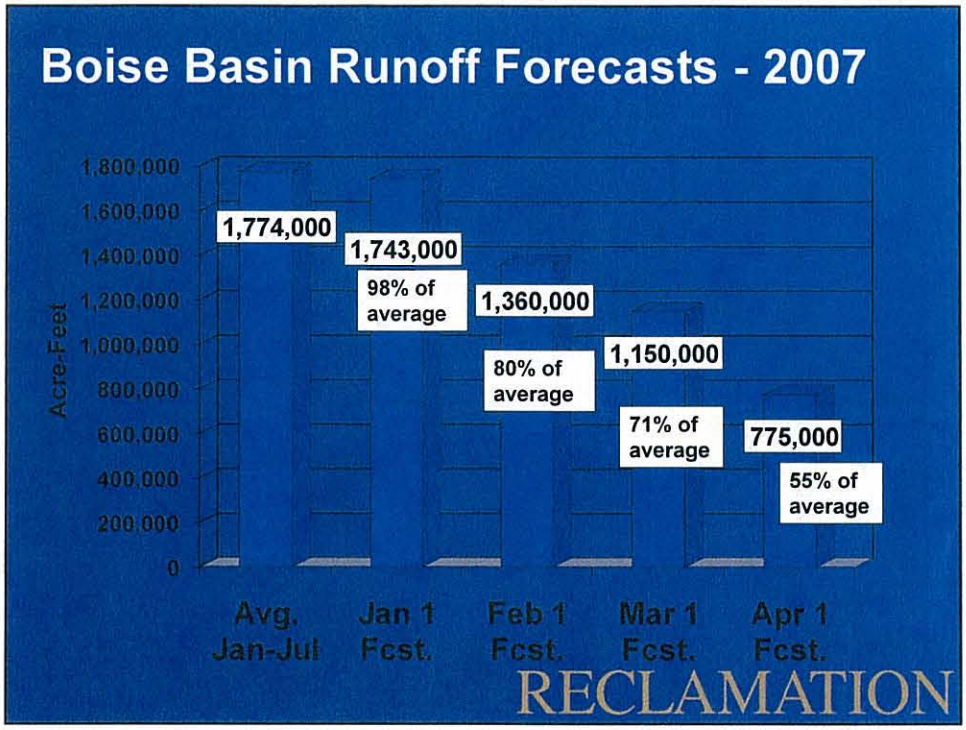

Mores Creek Summit SNOTEL
2010
2006
2001
1983
1997
30-yr Avg
inches of water
50
48
46
44
42
40
38
36
34
32
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Oct 1
Nov 1
Dec 1
Jan 1
Feb 1
Mar 1
Apr 1
May 1
Jun 1
Jul 1


Boise Basin Runoff Forecasts - 2007
Acre-Feet
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
1,774,000
1,743,000
98% of average
1,360,000
80% of average
1,150,000
71% of average
775,000
55% of average
Avg. Jan-Jul
Jan 1 Fcst.
Feb 1 Fcst.
Mar 1 Fcst.
Apr 1 Fcst.
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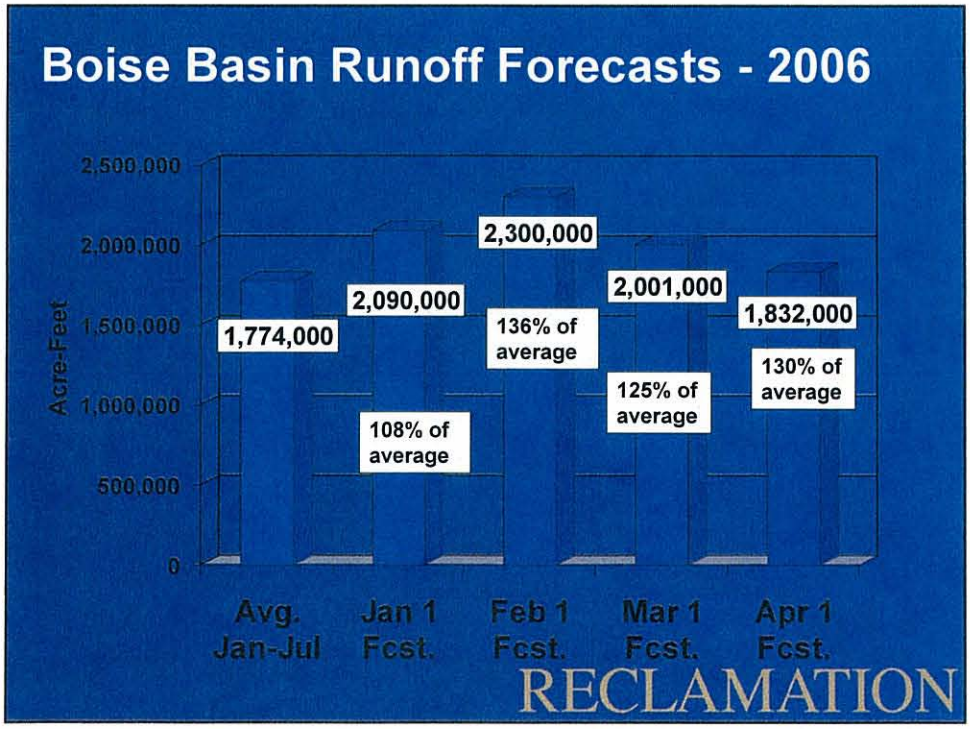
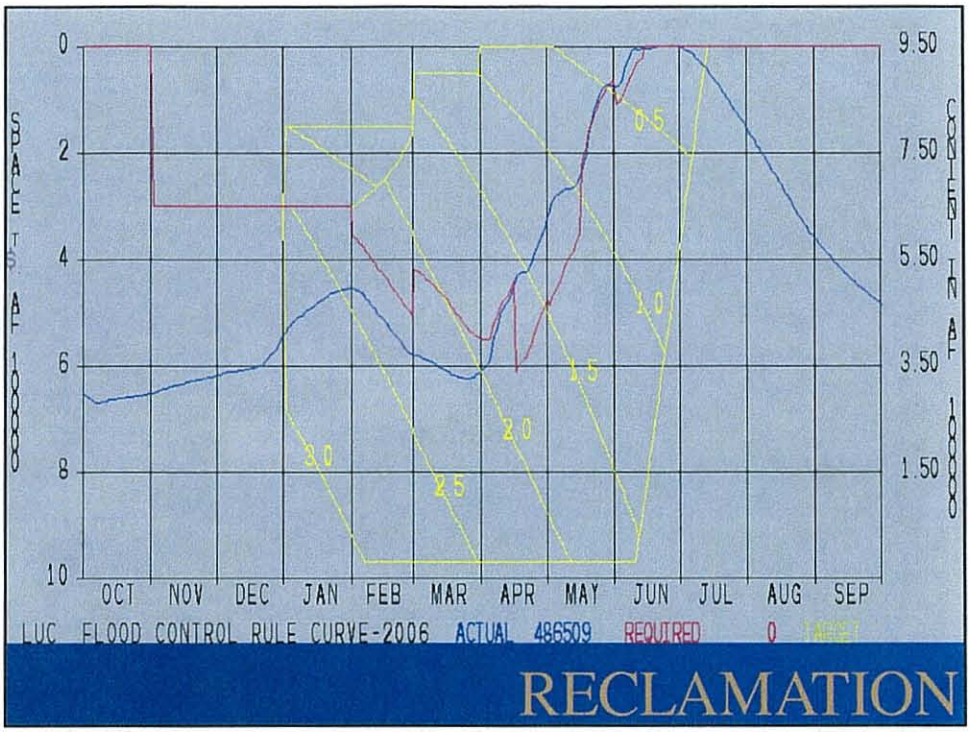

Boise Basin Runoff Forecasts - 2006
Acre-Feet
2,500,000
2,000,000
1,500,000
1,000,000
500,000
0
1,774,000
2,090,000
108% of average
2,300,000
136% of average
2,001,000
125% of average
1,832,000
130% of average
Avg. Jan-Jul
Jan 1 Fcst.
Feb 1 Fcst.
Mar 1 Fcst.
Apr 1 Fcst.
RECLAMATION


0
2
4
6
8
10
9.50
7.50
5.50
3.50
1.50
OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP
0.5
1.0
1.5
2.0
2.5
3.0
LUC FLOOD CONTROL RULE CURVE-2006 ACTUAL 486509 REQUIRED 0
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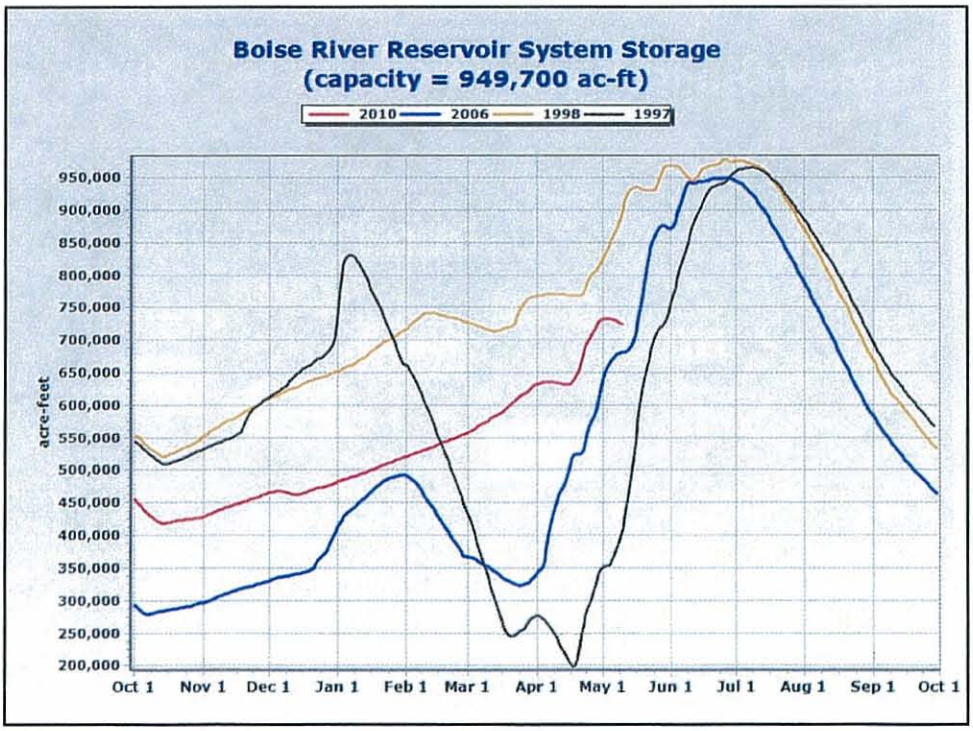
Boise River Reservoir System Storage
(capacity = 949,700 ac-ft)
2010 2006 1998 1997
acre-feet
950,000
900,000
850,000
800,000
750,000
700,000
650,000
600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
Oct 1 Nov 1 Dec 1 Jan 1 Feb 1 Mar 1 Apr 1 May 1 Jun 1 Jul 1 Aug 1 Sep 1 Oct 1

Eagle Island, Spring 1998

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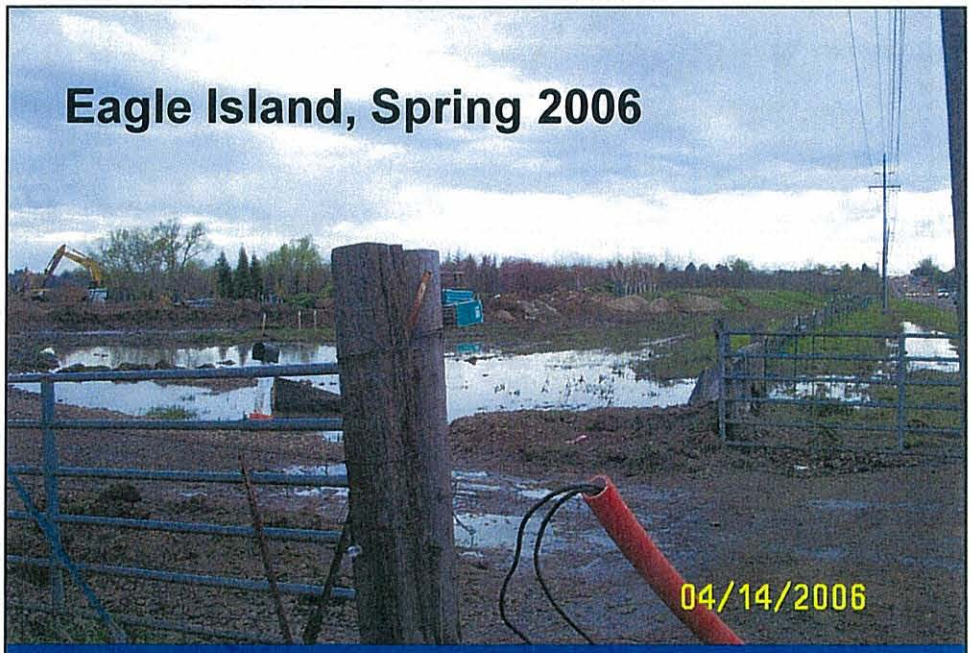
Eagle Island, Spring 2006



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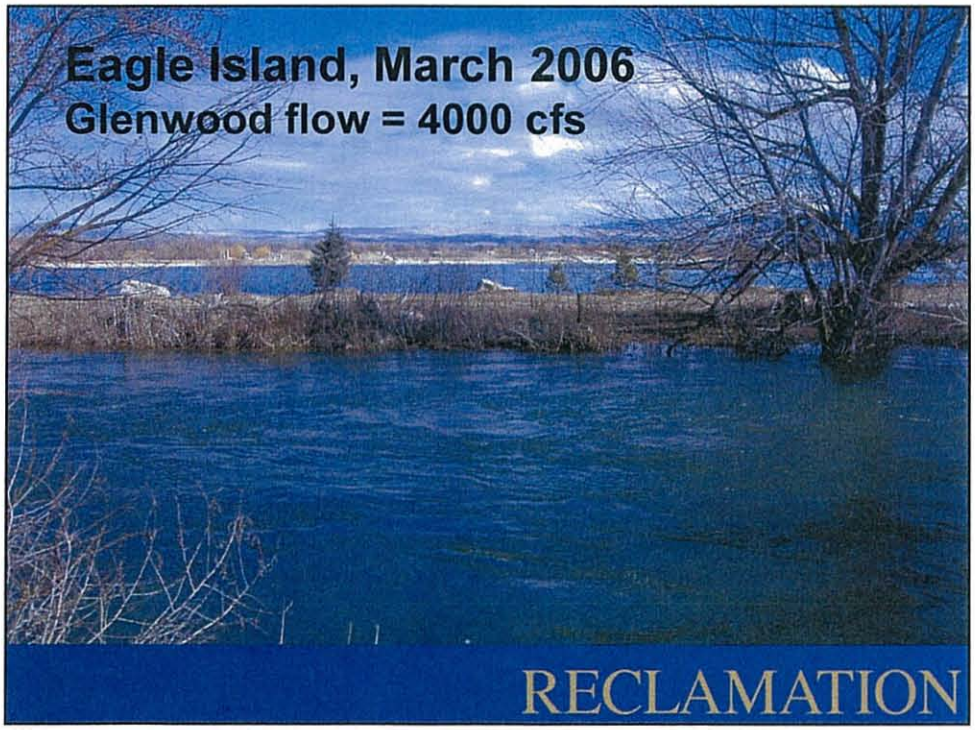
Eagle Island, Spring 2010


Eagle Island, March 2006
Glenwood flow = 4000 cfs
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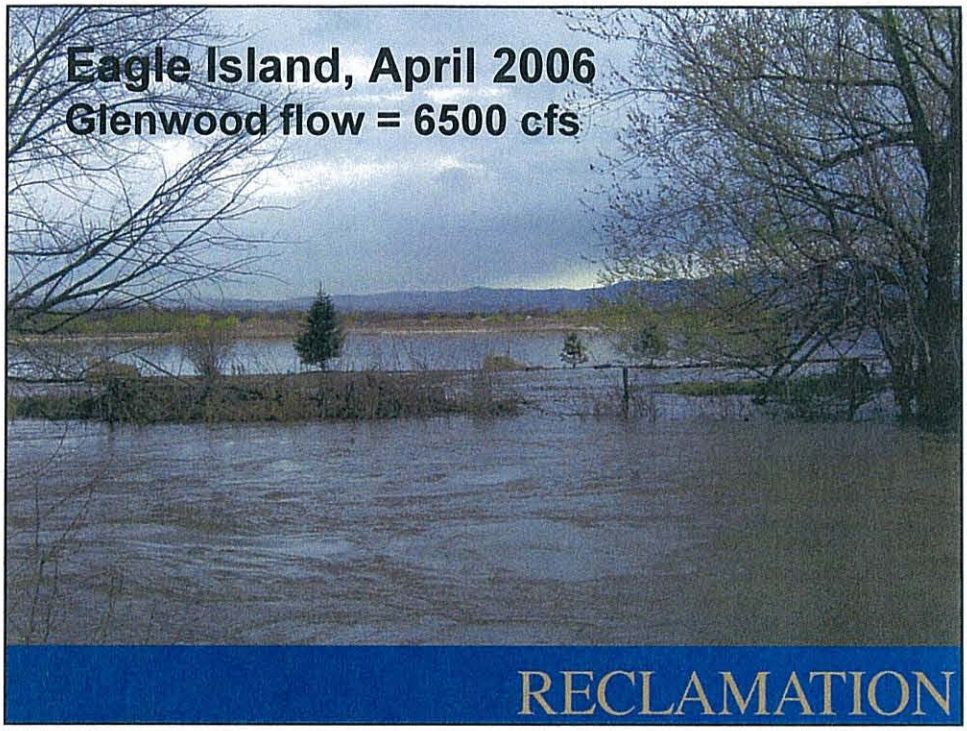
Eagle Island, April 2006
Glenwood flow = 6500 cfs
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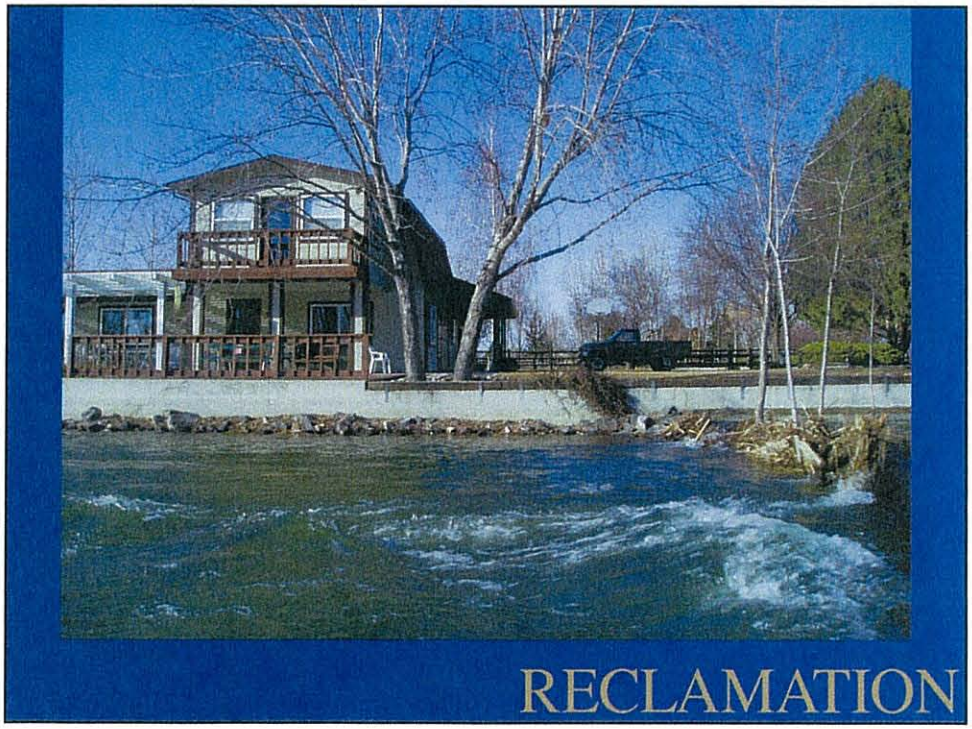
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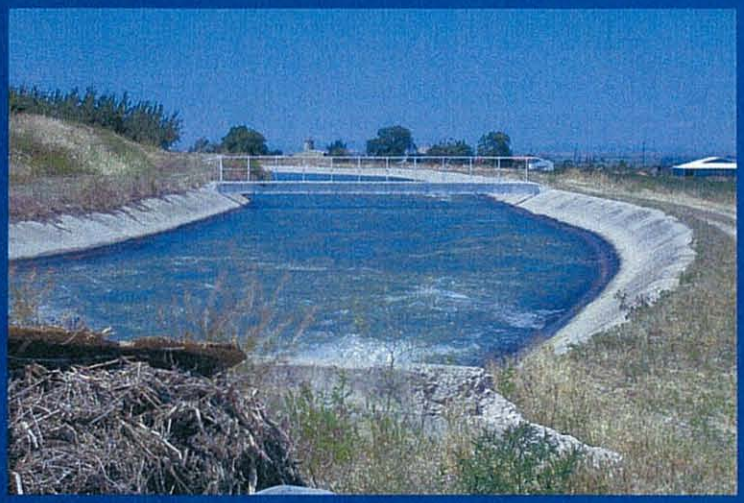
Water Supply Operations



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Water Year Total Runoff Volume Upstream of Lucky Peak Reservoir

Year	Total Outflow (ac-ft)
1997	3,571,000
1996	2,902,000
→ 2006	2,719,000
1995	2,447,000
1999	2,417,000
1998	2,226,000
1993	2,096,000
→ 2008	1,764,000
2009	1,700,000
2000	1,647,000
2003	1,638,000
2002	1,527,000
2004	1,427,000
2005	1,254,000
→ 2007	1,241,000
1990	1,170,000
1991	1,012,000
1994	905,000
2001	884,000
1992	804,000
Average of past 20 years =	1,767,000

2006 – Above average runoff

2008 – Average runoff

2007 – Below average runoff

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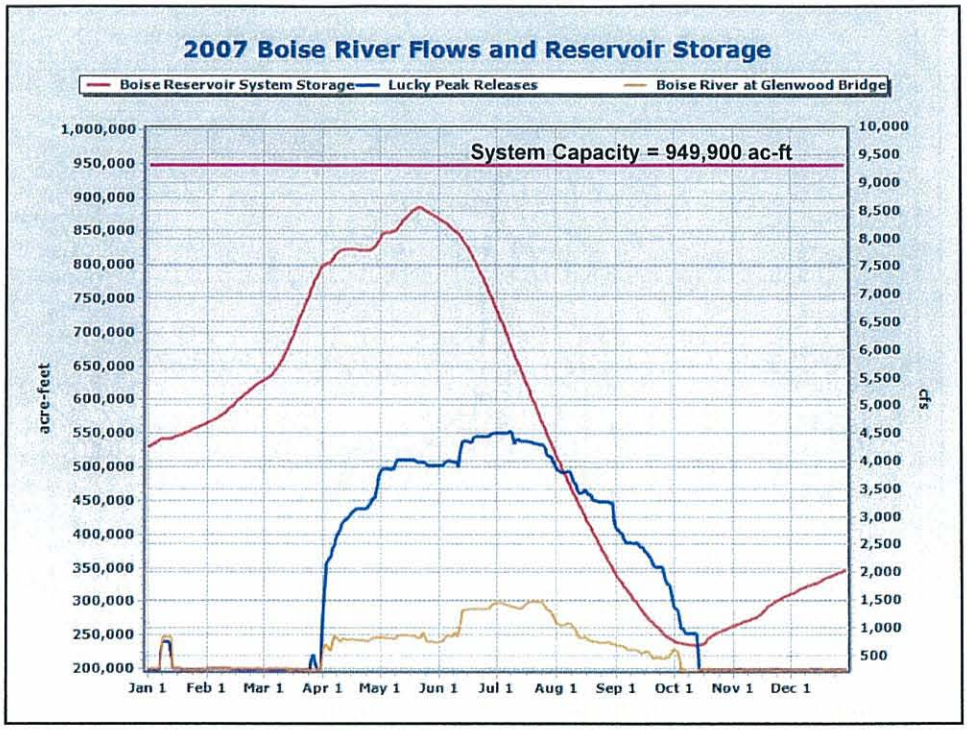
2007 Boise River Flows and Reservoir Storage
Boise Reservoir System Storage
Lucky Peak Releases
Boise River at Glenwood Bridge
System Capacity = 949,900 ac-ft
acre-feet
cfs
1,000,000
950,000
900,000
850,000
800,000
750,000
700,000
650,000
600,000
550,000
500,000
450,000
400,000
350,000
300,000
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4,500
4,000
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Jan 1
Feb 1
Mar 1
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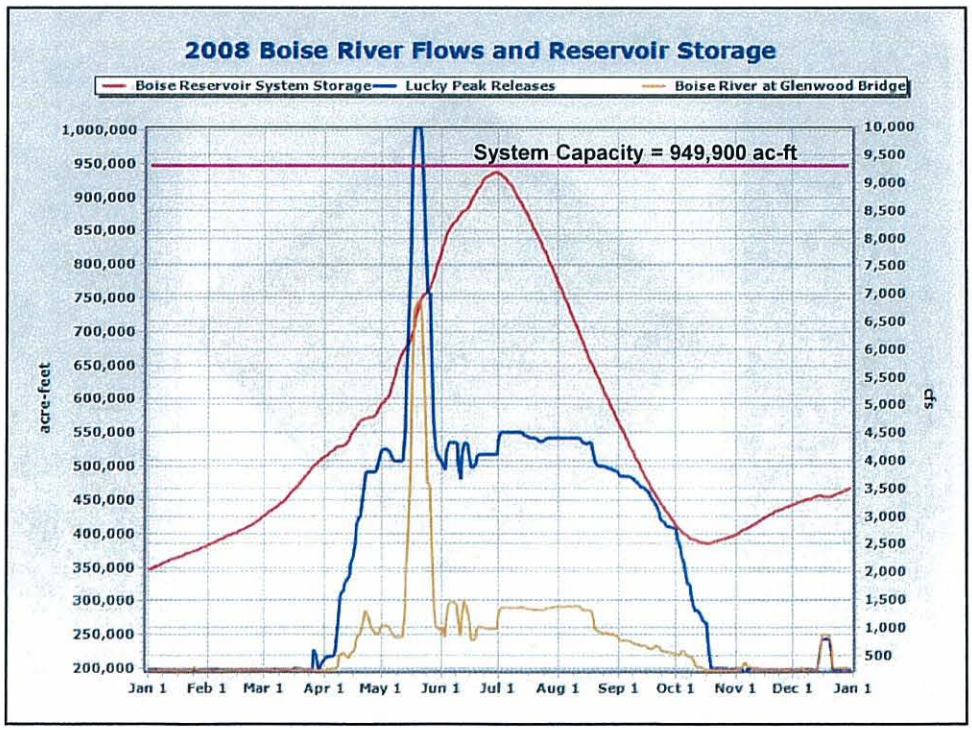
Sep 1
Oct 1
Nov 1
Dec 1


2008 Boise River Flows and Reservoir Storage
Boise Reservoir System Storage
Lucky Peak Releases
Boise River at Glenwood Bridge
System Capacity = 949,900 ac-ft
acre-feet
cfs
1,000,000
950,000
900,000
850,000
800,000
750,000
700,000
650,000
600,000
550,000
500,000
450,000
400,000
350,000
300,000
250,000
200,000
10,000
9,500
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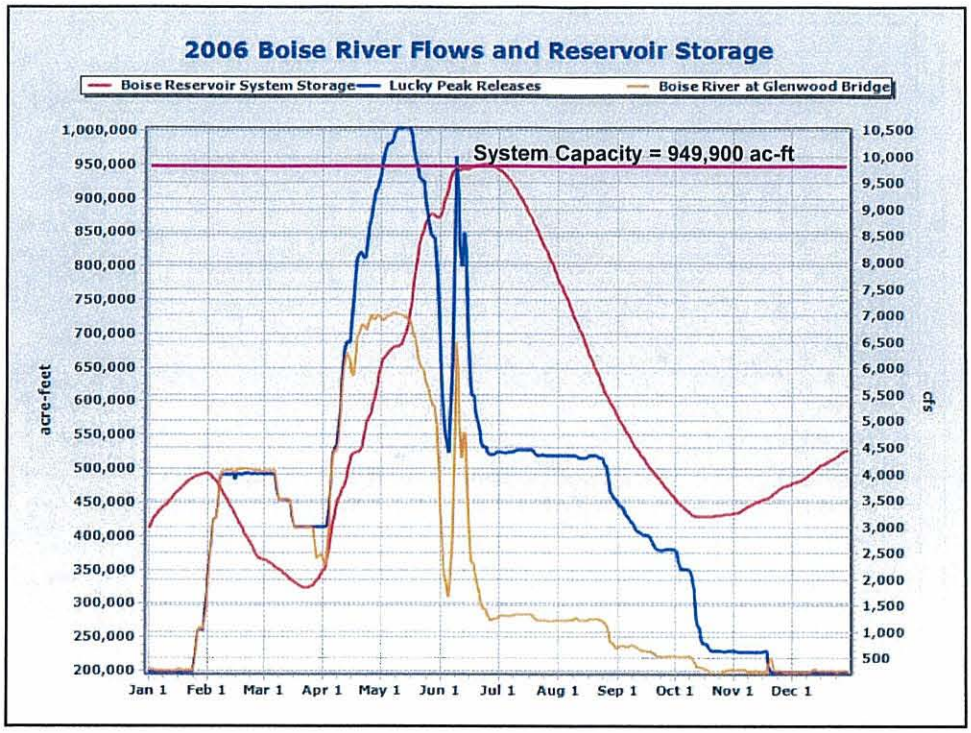
Dec 1
Jan 1



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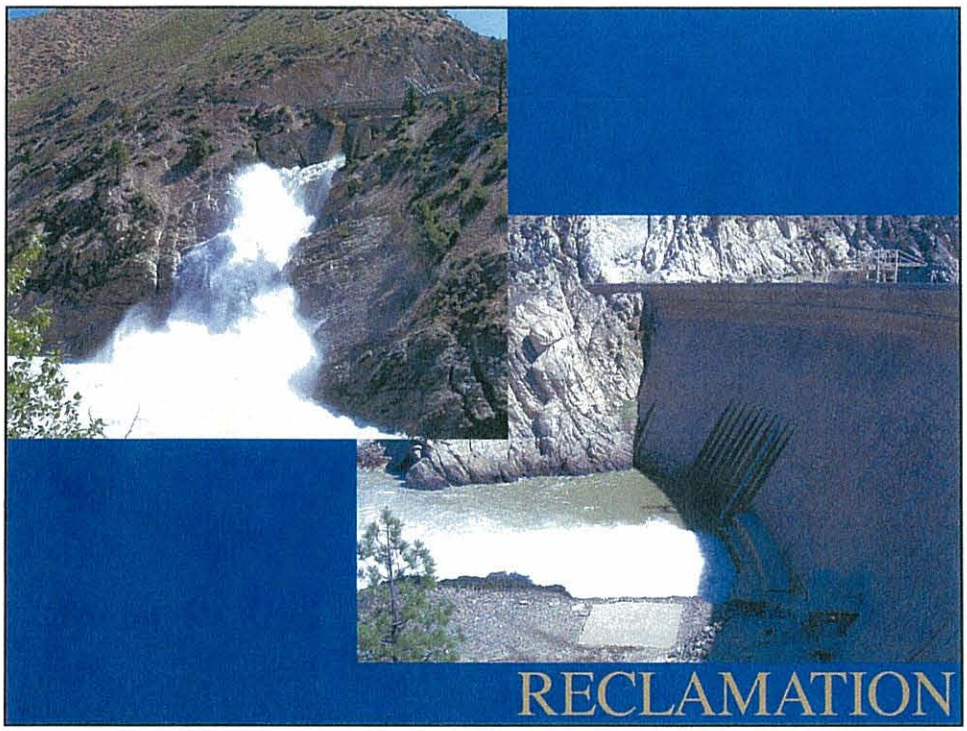
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