

KLAMATH PROJECT

2004 OPERATIONS PLAN

April 7, 2004

INTRODUCTION

This is the 2004 Operations Plan (Plan) for the Bureau of Reclamation’s (Reclamation) Klamath Project (Project), which is located within the upper Klamath River Basin in southern Oregon and northern California. This Plan describes Project operations from April 1, 2004 through March 31, 2005 based upon current and expected hydrologic conditions and consistent with the biological opinions¹ issued by the U.S. Fish and Wildlife Service (Service) and National Oceanic and Atmospheric Administration (NOAA) Fisheries (formerly the National Marine Fisheries Service). The Plan is initially derived from the April 1, 2004 Natural Resource Conservation Service (NRCS) inflow forecast. Reclamation developed this Plan to serve as a planning aid for agricultural water users, Klamath Basin Tribes, national wildlife refuges and other interested parties. Operating the Project in the manner described in this Plan is consistent with the Department of the Interior’s and Reclamation’s tribal trust responsibilities in the Klamath Basin and we will continue to consult on a government-to-government basis with the Klamath Basin Tribes throughout the operating year on Project operations. A planning process for multi-year operations of Project through 2012 is ongoing. Attachment A summarizes the planning methodology Reclamation used to develop the Plan. This plan provides an estimated Project water supply to the following areas:

- Upper Klamath Lake delivery area: This area generally includes lands in Oregon and California that receive Project water primarily from Upper Klamath Lake (UKL) and/or the Klamath River. This area also includes the Tule Lake and Lower Klamath National Wildlife Refuges.
- East Side delivery area: This area generally includes lands within the Langell Valley Irrigation District and Horsefly Irrigation District on the east side of the Project area. This area receives water from Clear Lake Reservoir, Gerber Reservoir and the Lost River.

UPPER KLAMATH LAKE (UKL) DELIVERY AREA

1. ESTIMATED INFLOW TO UKL DURING 2004:

- The predicted inflow (in acre-feet) to UKL from April 1 through September 30, 2004, using the NRCS forecast at 50% exceedance, is 420,000 acre-feet for lake elevation operational criteria²; and at 70% exceedance, is 366,000 acre-feet for river flow operational criteria.

2. UKL WATER YEAR TYPE DURING 2004:

- The initial water year type applicable to Upper Klamath Lake is BELOW AVERAGE for lake elevation operations planning, subject to changes to actual hydrologic conditions subsequent to April 1. Table 1 shows the four water year types used for lake elevation operations planning:

Table 1. UKL Water Year Types for Lake Elevation Planning

	Water Year Type			
	Above Average	Below Average	Dry	Critical Dry
UKL Inflow (1000 acre-feet)	More than 500	500 to 312	312 to 185	Less than 185
Occurrence(s) during 10-yr period	1993, 1995, 1996, 1997, 1998, 1999	1990	1991	1992, 1994

¹ U.S. Fish and Wildlife Service and National Marine Fisheries Service Biological Opinions on Klamath Project Operations from June 1, 2002 through March 31, 2012, respectively dated May 31, 2002.

² In accordance with RPA-Element 1 of the Service’s May 31, 2002 Biological Opinion (pg. 118).

- The initial water year type applicable to the Klamath River is BELOW AVERAGE for river flow operations planning, subject to changes in actual hydrologic conditions subsequent to April 1. Table 2 shows the five water year types for river flow operations planning:

Table 2. UKL Water Year Types for River Flow Planning

	Water Year Type				
	Wet	Above Average	Average	Below Average	Dry
UKL Inflow (1000 acre-feet)	More than 785.2	785.2 to 568.6	568.5 to 458.4	458.3 to 286.8	Less than 286.8
Occurrences(s) during 10-yr period	1999	1993, 1996, 1998	1995, 1997	1990	1991, 1992, 1994

3. LAKE ELEVATION AND RIVER FLOW OPERATIONAL CRITERIA FOR UKL:

- Reclamation will operate the Project to ensure that elevations in UKL do not recede lower than the average end-of-month elevations that occurred between October 1, 1989 and September 30, 1999 (the “ten-year” period) for the corresponding water year type³. Table 3 displays these elevations:

Table 3. Lake Elevation Operational Criteria for UKL

	Water Year Type			
	Above Average	Below Average	Dry	Critical Dry
March 31	4142.5	4142.7	4141.7	4142.0
April 30	4142.9	4142.8	4142.2	4141.9
May 31	4143.1	4142.7	4142.4	4141.4
June 30	4142.6	4142.1	4141.5	4140.1
July 31	4141.5	4140.7	4140.3	4138.9
August 31	4140.5	4139.6	4139.0	4137.6
September 30	4139.8	4138.9	4138.2	4137.1
October 31	4139.7	4138.8	4138.2	4137.3
November 30	4140.3	4139.0	4139.0	4138.1
December 31	4141.0	4138.8	4139.7	4138.9
January 31	4141.5	4139.5	4140.3	4140.1
February 28	4141.9	4141.7	4140.4	4141.1

- Reclamation will operate the Project to ensure that Klamath River flows at Iron Gate Dam (IGD) meet or exceed the operational criteria in Table 4. Table 4 incorporates revisions made to Table 5.9 consistent with the Reasonable and Prudent Alternative in the final biological opinion⁴.

Table 4. Klamath River Operational Criteria for Flows at IGD

	Water Year Type and Flow (cubic feet/second)				
	Wet	Above Average	Average	Below Average	Dry
April 1-15	5932	2955	1863	1826	822
April 16-30	5636	2967	2791	1431	739
May 1-15	3760	2204	2784	1021	676
May 16-31	2486	1529	1466	1043	731
June 1-15	1948	1538	827	959	641
June 16-30	1921	934	1163	746	617
July 1-15	1359	710	756	736	516
July 16-31	1314	710	735	724	515
August	1149	1039	1040	979	560
September	1341	1316	1300	1168	731
October	1430	1346	1345	1345	907
November	1822	1414	1337	1324	899
December	1822	1387	1682	1621	916
January	2792	1300	3618	1334	1030
February	4163	1300	1300	1806	673
March 1-15	8018	1953	2143	2190	688
March 16-31	6649	4009	2553	1896	695

³ U.S. Fish and Wildlife Service. Biological Opinion on Klamath Project Operations from June 1, 2002 through March 31, 2012, dated May 31, 2002. pages 11 and 118.

⁴Source: Table 5.9, February 25, 2002 BA, as modified by conversion to five water year types.

- The river flow operational criteria include the following down ramping rates at IGD:
 1. When IGD flows are above 1750 cubic feet per second (CFS): Decreases in flows of 300 CFS or less per 24-hour period, and no more than 125 CFS per four-hour period.
 2. When IGD flows are 1,750 CFS or less: Decreases in flows of 150 CFS or less per 24-hour period, and no more than 50 CFS per two-hour period.
- The lake elevation operational criteria will use a curve to transition from one end-of-month elevation to the succeeding month, as described in Attachment A. A similar curve for river flows is still being developed for future use.

4. PROJECT WATER BANK FOR 2004:

- Beginning on April 1, and extending throughout the irrigation season of each year, Reclamation will release water bank water to supplement river flows according to the flow schedule agreed upon between NOAA Fisheries and Reclamation (Table 5). As long as these releases, beginning on April 1 and continuing throughout the irrigation season, comply with agreed-upon flow schedules, regardless of whether spill conditions contributed to achieving those flows, Reclamation will have fulfilled its BO flow obligations. Reclamation understands that NOAA Fisheries agrees to this provision⁵. If the water year type is changed, then NOAA Fisheries and Reclamation will agree upon the amount of the water bank water remaining in, or estimated to accrue to, the water bank to use in a revised augmented flow schedule appropriate for the new water year type.
- The Project water bank will be 75,000 acre-feet. During 2004, Reclamation is pursuing reasonable options for securing water to meet the water bank requirement. Table 5 displays the flows (CFS) at Iron Gate Dam (IGD) resulting from NOAA Fisheries' recommended distribution of the water bank (75,000 acre-feet) during a BELOW AVERAGE water year type (WYT):

Table 5. Recommended IGD Flows Provided with Project Water Bank (BELOW AVERAGE)

	"Below Average" WYT IGD Base Flow (Source-Table 4)	Additional Flow Provided by Water Bank	NOAA Fisheries' Recommended IGD Flow (using Water Bank)	Water Bank Amount used to Provide Recommended Flow (acre-feet)
April 1-8	1826	174	2000	2756
April 9-15	1826	0	1800	0
April 16-20	1431	319	1750	3164
April 21-26	1431	269	1700	2668
April 27-30	1431	219	1650	1738
May 1	1021	629	1650	1248
May 2-6	1021	579	1600	5742
May 7-11	1021	529	1550	5246
May 12-15	1021	479	1500	4750
May 16	1043	457	1500	906
May 17-21	1043	407	1450	4036
May 22-26	1043	357	1400	3541
May 27-31	1043	307	1350	3045
June 1-5	959	341	1300	3382
June 6-10	959	291	1250	2886
June 11-15	959	241	1200	2390
June 16-20	746	404	1150	4007
June 21-25	746	354	1100	3511
June 26-30	746	304	1050	3015
July 1-15	736	264	1000	7855
July 16-31	724	276	1000	8759
August 1-31	979	21	1000	1291
September 1-30	1168	0	1168	0
Total Water Bank Amount Used				75,936

⁵ Letter from NOAA Fisheries to Reclamation dated April 2, 2004.

5. ESTIMATED PROJECT WATER SUPPLY FROM UKL FOR IRRIGATION AND REFUGES DURING 2004:

- Water Supply for Irrigation. The estimated Project water supply (assuming a BELOW AVERAGE water year type) for irrigation from UKL from April 1 through September 30, 2004 is 335,000 acre-feet based upon the hydrological conditions existing on April 1. This may be reduced by the amount of water acquired for the water bank through land idling and groundwater substitution. This amount may increase or decrease in response to hydrological conditions after April 1 because actual conditions may differ widely from those assumed by the operation forecast model. Project water deliveries after October 15, would be contingent upon availability of water from UKL and hydrological conditions from October 2004 through March 2005.
- Water Supply for Refuges. The estimated amount of Project water from UKL for delivery to national wildlife refuges from April through October 2004 will be 25,000 acre-feet. This was estimated in relation to historic deliveries to refuges.

EAST SIDE DELIVERY AREA

ESTIMATED PROJECT WATER SUPPLY FOR THE EAST SIDE DELIVERY AREA DURING 2004:

- The estimated Project water supply for irrigation from Gerber Reservoir and Clear Lake from April 1 through September 30, 2004 is 71,320 acre-feet. Table 6 displays the projected elevations of Gerber Reservoir and Clear Lake on April 1; the minimum elevations needed to meet the biological requirements of endangered suckers on September 30 (i.e. to provide adequate over-wintering habitat for endangered suckers); and the difference between the April 1 and September 30 reservoir/lake capacities, minus evaporation and seepage. The difference between the reservoir/lake capacity on April 1 and September 30 is the estimated Project water supply for irrigation.

Table 6. Estimated Project Water Supply for East Side Delivery Area

	Projected April 1 Elevation	April 1 Capacity (acre-feet)	ESA Minimum Sept 30 Elevation	Sept 30 Capacity (acre-feet)	Apr 1-Sept 30 evap/seepage (acre-feet)	Net diff. between Apr. 1 and Sept 30 capacities
Gerber Reservoir	4822.49	49,770	4798.1	1,300	6,400 (est)	42,070
Clear Lake	4526.24	130,400	4520.6	41,150	60,000 (est)	28,250
Total amount of project water available for East Side delivery area						71,320

OTHER INFORMATION RELEVANT TO 2004 OPERATIONS PLAN

COMPARISON OF ESTIMATED WATER SUPPLY TO HISTORIC DELIVERY:

- The following comparison is provided for information purposes only and uses a BELOW AVERAGE water year type for the UKL delivery area (5 WYT) and a BELOW AVERAGE water year type for the East Side delivery area (4 WYT). Table 7 compares the 2004 estimated Project water supply for irrigation and refuges to historical deliveries from 1961 to 2003.

Table 7. Comparison of Estimated 2004 Project Water Supply to Historic Deliveries

	2004 Estimated Supply (1000 acre-feet)	Historic Delivery (1961-2003) During BELOW AVERAGE Water Year Types (1000 acre-feet)
UKL Delivery Area	335.0	Ave = 299.0 (235.0 to 330.0)
National Wildlife Refuges	25.0	Ave = 36.9 (16.3 to 58.1)
East Side Delivery Area	71.3	Ave = 74.4 (56.5 to 89.5)

ATTACHMENT A

Klamath Project - 2004 Operations Plan

GENERAL DESCRIPTION OF 2004 OPERATIONS PLANNING PROCESS

The 2004 operations plan was developed in accordance with the 2002 Service and NOAA Fisheries biological opinions. The information in the plan is developed as follows:

FOR THE UPPER KLAMATH LAKE (UKL) DELIVERY AREA:

1. ESTIMATE INFLOWS TO UKL:

- Reclamation estimates the inflow (in acre-feet) using the NRCS forecast beginning in early January (for information purposes) and revises the inflow predictions in early February, March and on April 1. The estimate of predicted inflows uses the 50% exceedance for UKL for lake elevation planning considerations⁶ and a 70% exceedance for UKL river flow planning considerations.

2. DETERMINE WATER YEAR TYPE FOR 2004:

- UKL water year types for Project operations planning purposes are defined by historic, actual inflow. The methodology used to define the water year type parameters was explained in the *Klamath Project 1998 Operations Plan Environmental Assessment*⁷. For UKL, water year type is defined by the forecast inflow between April 1 and September 30 annually. In early April (usually on or after April 10), Reclamation will determine the water year type most likely to occur from April through September. As a result of ESA consultation, two sets of water year types have been defined for purposes of annual operations planning⁸. For lake elevation planning, Reclamation will use four water year types: (1) above average; (2) below average; (3) dry; and (4) critical dry. For river flow planning, Reclamation will use five water year types: (1) wet; (2) above average; (3) average; (4) below average and; (5) dry. Reclamation will continue to monitor the NRCS forecasts in May and June. After June, actual inflow to UKL will be regularly monitored. The continued monitoring of predicted and actual inflows will allow Reclamation to adapt Project operation to respond to the actual water year type if precipitation and hydrological conditions after April 1 vary significantly from conditions prior to April 1. The water year type can, and will, be changed to either wetter or drier year types after April 1, if necessary, in response to actual hydrologic conditions⁹.

3. LAKE ELEVATION AND RIVER FLOW OPERATIONAL CRITERIA FOR 2004:

- Water deliveries for irrigation from UKL will be provided within the operations regime observed from water year 1990 through water year 1999 (ten-year period) consistent with the findings of the National Research Council's Interim Report of February 2002. The observed values for the lake levels and river flows that occurred during the ten-year period were used as criteria to determine the Project's irrigation and refuge deliveries in Reclamation's biological

⁶ In accordance with RPA-Element 1 of the FWS May 31, 2002 Biological Opinion (pg. 118).

⁷ Klamath Project 1998 Annual Operations Plan Environmental Assessment. Pgs. 14-15.

⁸ U.S. Fish and Wildlife Service and National Marine Fisheries Service Biological Opinions on Klamath Project Operations from June 1, 2002 through March 31, 2012, respectively dated May 31, 2002.

⁹ In accordance with Memorandum and Letters to the Service, NOAA Fisheries and Klamath Basin Tribes dated July 10, 2002.

assessment (BA). The operational criteria for river flows have been revised to be consistent with the reasonable and prudent alternative (RPA) in NOAA Fisheries 2002 biological opinion. That biological opinion specifies that during Phase I (2002-2005) Reclamation will operate the Project to meet or exceed the Klamath River flows at Iron Gate Dam described in Table 5.9 of the biological assessment (as modified by conversion to five water year types) plus the additional volume of water to be provided by the water bank¹⁰. It also states that the flows would be modified on an annual basis by agreed upon use of the water bank for improved spring flows and/or summer flows and that by March 31 of each year, NMFS and Reclamation will determine how this additional water will be distributed for release.

- The lake elevation and river flow operational criteria specify certain elevations/flows at certain time steps (end-of-month for lake elevations and average monthly or semi-monthly for river flows). During Project operations in 2002 and 2003, Reclamation found that transitioning from one time step to the next succeeding step resulted in abrupt changes in elevations/flows, especially when the water year type was changed to either a wetter or drier year types after April 1, as described in No. 2 above. Such abrupt changes were at times viewed as being adverse to the lake or river resources. For 2004 operations, Reclamation developed a curve, rather than abrupt steps, to permit a smoother transition of lake elevations from one time step to the next¹¹. The curve was developed in consultation with the Service, Tribes and water users. A similar curve is being developed for river flows but will not likely be available for use during 2004.

4. QUANTIFY THE PROJECT WATER BANK REQUIREMENTS FOR 2004:

- Reclamation's 2002 BA proposed establishment and use of a "water bank" and that the size of the water bank would be determined using criteria set out in the 2002 BA. However, as a result of ESA consultation, the Service and NOAA Fisheries established the water bank size for 2004 at 75,000 acre-feet in the 2002 biological opinions (page 11 and page 56 in the respective opinions). Therefore, the water bank size has been determined and does not require the calculation as outlined in the 2002 BA. Reclamation has agreed to operate the Project during 2004 consistent with the 2002 biological opinions¹².
- During 2004, Reclamation will pursue reasonable options for securing water to meet the water bank requirement. Reclamation believes that several sources of water, including regulatory storage, forbearance of surface water use, and groundwater may be feasible for the water bank. Forbearance of surface water includes water used for both irrigation and refuges. Forbearance of irrigation use involves farmers voluntarily idling their lands in return for compensation. Groundwater or conjunctive use involves using pumped groundwater from wells to supplement surface water supplies. There may be additional shortages to irrigation and refuge deliveries due to hydrological conditions after the water bank is deducted from the Project water supply. Agricultural users would not be compensated for these additional shortages that result from unanticipated hydrologic conditions.
- The initial water year type for 2004 has been determined to be BELOW AVERAGE and the distribution of the water bank is shown in Table 5 of the 2004 Operations Plan. The following table displays the water bank distribution, as agreed to by NOAA Fisheries, if the water year type is changed after April 1 to an AVERAGE water year type:

¹⁰ National Marine Fisheries Service. Biological Opinion on Klamath Project Operations from June 1, 2002 through March 31, 2012, dated May 31, 2002. pages 55-56.

¹¹ Memorandum from Reclamation to the Service dated April 2, 2004.

¹² Letter from Reclamation's Mid-Pacific Regional Director to the Service and NOAA Fisheries dated January 2, 2003.

Recommended IGD Flows Provided with Project Water Bank (AVERAGE WYT)

	“Average” WYT IGD Base Flow (Source-Table 4)	Additional Flow Provided by Water Bank	NOAA Fisheries’ Recommended IGD Flow (using Water Bank)	Water Bank Amount used to Provide Recommended Flow (acre-feet)
April 1-15	1863	337	2200	10026
April 16-30	2791	0	2791	0
May 1-15	2784	0	2784	0
May 16-20	1466	1034	2500	10255
May 21-25	1466	734	2200	7279
May 26-30	1466	534	2000	5296
May 31	1466	334	1800	662
June 1-4	827	973	1800	7720
June 5	827	823	1650	1632
June 6-9	827	773	1600	6133
June 10	827	623	1450	1236
June 11-15	827	573	1400	5683
June 16-30	1163	137	1300	4076
July 1-15	756	244	1000	7260
July 16-31	735	265	1000	8410
August 1-31	1040	0	1040	0
September 1-30	1300	0	1300	0
Total Water Bank Amount Used				75,668

- Reclamation’s compliance with the biological opinions requires a water bank which involves acquiring water from all components of the Project, including refuges. The water bank amount has been established for 2004 (i.e. 75,000 acre-feet). The extent that the irrigation and refuge components of the Project provide water for the water bank will be based upon their Project water use. This means that when Project irrigators are required to reduce a portion of their Project water use through forbearance, then Project water deliveries to refuges would be reduced by a similar proportion.

5. ESTIMATE PROJECT WATER SUPPLY FOR IRRIGATION AND REFUGES FOR 2004:

Reclamation estimated the Project water supply for irrigation and refuges available from the Klamath River upstream from Keno Dam by:

- First, estimating inflow from April 1 through September 30, 2004.
- Second, determining the applicable water year type for 2004.
- Third, quantifying the applicable water bank amount for 2004.
- Fourth, determining the minimum historic amount of water for agriculture based on the year type:
- Fifth, using the elevation/flow operational criteria for the applicable water year type.
- Last, estimating the available Project water supply, after deducting the water bank amount, using the KPOPFOR forecasting model that may be available, keeping in mind that actual conditions may differ significantly from the model.

6. REFUGE WATER SUPPLY:

- Project water has historically been delivered to Tule Lake and Lower Klamath National Wildlife Refuges during Project operation (see Table 7) for maintaining seasonal and permanent refuge wetlands. Reclamation considered historic refuge deliveries to assist with 2004 operations planning. The Service provided information related to refuge management and operation during various water year types. The refuges receive water year-round, not just during April-September. October-March water deliveries are important to the refuge and affect overall Project operation. Reclamation may be required to adjust refuge Project water deliveries to meet the 2002 biological opinion requirements and irrigation deliveries, when necessary. Should additional requirements for Project water develop then Project water deliveries to refuges could be further reduced. If additional hydrologic shortages occur, refuge deliveries could be completely curtailed.

- Reclamation stated in its 2002 BA that national wildlife refuges, including Tule Lake, Lower Klamath, Upper Klamath Lake and Clear Lake Refuges, are under the jurisdiction of the Service and their operation is subject to the Service's management and control¹³. The BA described only those effects on the refuges that resulted from operation of the Klamath Project and not the effects of refuge operation. During 2004, Reclamation will operate the Project consistent with the requirements of the 2002 biological opinions, including establishment/use of a water bank, and provide adequate water to Lower Klamath and Tule Lake National Wildlife Refuges, when in priority and when water is available¹⁴. This requires consideration of refuge water deliveries as part of the 2004 operations plan because those deliveries contribute to Reclamation's ability to meet the biological opinion requirements and its legal obligations.

7. OTHER INFORMATION RELEVANT TO THE OPERATIONS PLAN:

Reclamation considered other information relevant to the operations plan that could influence the UKL Project water supply for irrigation and refuges, such as:

- Comparing the estimated 2004 Project water supply for the UKL delivery area to historic UKL irrigation and refuge deliveries, and comparing the estimated 2004 Project water supply for the East Side delivery area to historic East Side irrigation deliveries. The comparison of estimated supplies to historic deliveries serves to inform both Reclamation and Project water users of potential needs for additional demand reduction/supply enhancement measures. Reclamation may investigate and implement measures to either further reduce demand or enhance supply as a result of the comparison, if needed. Such measures would be in addition those implemented to establish the water bank.
- Reclamation considered the effects of pre-season fall/winter irrigation of agricultural and lease lands in the UKL delivery area. This pre-irrigation could, during drier hydrologic conditions, affect Reclamation's ability to meet the UKL operational criteria for endangered suckers by reducing the amount of water storage in the lake. If such a circumstance were to arise, then Project operation could be modified in response to pre-season irrigation and/or the available supply for pre-irrigation could be reduced. This condition did not occur prior to April 1, 2004.
- Precipitation in Klamath Falls, Oregon during February and March establishes the agricultural demand index when the irrigation season starts in early April. This index is integrated into operation planning model used to predict the Project water supply.

FOR THE EAST SIDE DELIVERY AREA:

ESTIMATED PROJECT WATER SUPPLY FOR THE EAST SIDE DELIVERY AREA DURING 2004:

- Reclamation will operate the Project reservoirs that serve the East Side delivery area (Gerber Reservoir and Clear Lake) consistent with the 2002 biological opinions, as amended to clarify application of the operational criteria for endangered suckers¹⁵. This operation ensures that reservoir/lake elevations do not recede lower than the minimum elevations needed to protect endangered suckers on September 30, i.e. elevations 4798.1 for Gerber Reservoir and 4520.6 for

¹³ Biological Assessment. The Effects of Proposed Actions Related to Klamath Project Operation (April 1, 2002-March 31, 2012) on Federally-listed Threatened and Endangered Species, dated February 25, 2002. pages 13-14.

¹⁴ Pacific Southwest Regional Solicitor's Memorandum, dated July 25, 1995, regarding certain legal rights and obligations related to the Bureau of Reclamation.

¹⁵ U.S. Fish and Wildlife Service. Amendment to 2002 Biological Opinion on the Effects of the 10-Year Operation Plan for the Klamath P (FWS#1-10-02-F-121), as it Relates to Operation of Clear Lake and Gerber Reservoir. March 4, 2003.

Clear Lake. Reclamation estimated the Project water supply for irrigation by: (1) determining the April 1 reservoir/lake volume (assuming that the April 1 elevation is no less than the minimum required elevation to protect endangered suckers); (2) adding any inflows and subtracting evaporation/leakage between April 1 and September 30; and (3) subtracting the September 30 reservoir/lake volume at the minimum required elevations to protect endangered suckers.