Attachment 2—Summary of Flow Recommendations to benefit endangered fishes in the Colorado and Gunnison rivers.

The Flow Recommendations generally call for higher spring peak flows and lower base flows to produce a more natural river hydrograph. Flow Recommendations are designed to meet the physical and biological needs of the endangered fishes. A summary of the Flow Recommendations is provided below. To review the entire report, go to http://www.usbr.gov/uc/wcao/rm/aspeis/pdfs/GunnCoFlowRec.pdf

RECOMMENDATION GOALS

→ Provide habitats and conditions that provide for spawning and reproduction;

→ Provide in-channel habitat for all life stages for endangered fish;

→ Provide backwater habitat and conditions necessary for overall fish health; and

→ Provide base flows that promote growth and survival of young fish during summer, autumn, and winter.

HYDROLOGIC CATEGORIES (Runoff varies year to year, dependent on snowpack)

→ **Wet (0--10% exceedance).—**A year during which the forecasted April—June runoff volume has been equal or exceeded in 10% or less of the years since 1937. This hydrologic condition has a 10% probability of occurrence.

→ **Moderate Wet (10--30% exceedance).**—A year during which the forecasted April—July runoff volume has been equaled or exceeded in 10-30% of the years since 1937. This hydrologic condition has a 20% probability of occurrence.

→ **Average Wet (30—50% exceedance).**—A year during which the forecasted April—July runoff volume has been equaled or exceeded in 30—50% of the years since 1937. This hydrologic condition has a 20% probability of occurrence.

→ **Average Dry (50—70% exceedance).**—A year during which the forecasted April—July runoff volume has been equaled or exceeded in 50—70% of the years since 1937. This hydrologic category has a 20% probability of occurrence.

→ **Moderate Dry (70—90% exceedance).**—A year during which the forecasted April—July runoff volume has been equaled or exceeded in 70—90% of the years since 1937. This hydrologic condition has a 20% probability of occurrence.

→ **Dry (90—100% exceedance).**—A year during which the forecasted April—July runoff volume has been equaled or exceeded in 90% or more of the years since 1937. This hydrologic condition has a 10% probability of occurrence.

INFLOWS TO BLUE MESA UNDER HYDROLOGIC CATEGORIES

→ **Wet**— Over 1,123,000 af (≥ 161% of average).

→ **Moderately Wet**— Between 871,000 af and 1,123,000 af (125—161% of average).

→ **Average Wet**— Between 709,000 and 871,000 af (102—125% of average).

→ **Average Dry.**— Between 561,000 and 709,000 af (80—102% of average).

→ **Moderately Dry.**— Between 381,000 and 561,000 (55—80% of average).

→ **Dry.**— Less than 381,000 af (< 55% of average).

SUMMER THROUGH WINTER BASE FLOW RECOMMENDATION FOR THE GUNNISON AND COLORADO RIVERS

Hydrologic Category	Gunnison River at Whitewater	Colorado River at Stateline
Wet; 0—10% Exceedance	1,500—2,500 cfs[2]	3,000—6,000 cfs
Moderately Wet; 10—30% Exceedance	1,050—2,500 cfs	3,000—4,800 cfs
Average Wet; 50—70% Exceedance	≥1,050—2,000 cfs	3,000—4,800 cfs
Average Dry; 50—70% Exceedance	≥1,050— ≥2,000 cfs	2,500—4,000 cfs
Moderately Dry; 70—90% Exceedance	≥750— ≥1,050 cfs	2,500—4,000 cfs
Dry; 90—100% Exceedance	≥750— ≥1,050 cfs	≥1,800 cfs

[2] cfs = cubic feet per second

SPRING PEAK-FLOW RECOMMENDATIONS FOR THE GUNNISON RIVER NEAR GRAND JUNCTION[3]

Hydrologic Category	Expected Occurrence	Flow Target and Duration[4]		Instantaneous Peak Flow (cfs)
		½ Fullbank Discharge Days/Year ≥ 8,070 cfs	Fullbank Discharge Days/Year ≥ 14,350 cfs	
Wet	10%	60—**100**	15—**25**	15,000—23,000[5]
Moderately Wet	20%	40—**60**	10—**20**	14,350-16,000[C]
Average Wet	20%	20—**25**	2—**3**	≥ 14,350[6]
Average Dry	20%	10—**15**	0—**0**	≥ 8,070[d]
Moderately Dry	20%	0—**10**	0—**0**	≥ 2,600[7]
Dry	10%	0—**0**	0—**0**	~ 900—4,000[8]
Long-term Weighted Average[9]		20—**32**	4—**7**	

For example, in a moderately wet year, flows of 14,350 cfs are recommended for 10-20 days.

[3] This table represents one possible way of achieving the long-term weighted average for sediment transport.
[4] Lower value in each range is for maintenance, higher (bold) value in each range is for improvement.
[5] Instantaneous peak flows within this range have occurred in these hydrologic categories since Blue Mesa Reservoir was closed. The observed instantaneous peaks are desired in the future in conjunction with meeting the flow targets. No specific peak flow with this range is recommended to ensure continued variability among years.
[6] Expected minimum peak flow when recommendations are met; actual peak may exceed the value, ensuring continued variability among years.
[7] Instantaneous peak flow that has occurred since Blue Mesa was closed. Peak flows are expected to equal or exceed this level in years when 8,070 cfs is not reached.
[8] Range of peak flows within this category that have occurred since Blue Mesa Reservoir was closed. Lowest number reflects base flow. Peak flows are expected to continue to occur within this range; no specific flow within this range is recommended, ensuring variability among years.
[9] Weighted values equals days/year x expected occurrence (the sum of all weighted average values equals the long-term weighted average in days/year.

SPRING PEAK-FLOW RECOMMENDATIONS FOR THE COLORADO RIVER NEAR THE COLORADO—UTAH STATE LINE[10]

Hydrologic Category	Expected Occurrence	Flow Target and Duration[11]		Instantaneous Peak Flow (cfs)
		½ Fullbank Discharge Days/Year ≥ 18,500 cfs	Fullbank Discharge Days/Year ≥ 35,000 cfs	
Wet	10%	80—**100**	30—**35**	39,300—69,800[12]
Moderately Wet	20%	50—**65**	15—**18**	35,000—37,500[13]
Average Wet	20%	30—**40**	6—**10**	≥ 35,000[14]
Average Dry	20%	20—**30**	**0**	18,500—26,600[d]
Moderately Dry	20%	0—**10**	**0**	9,970—27,300[15]
Dry	10%	**0**	**0**	5,000—12,100[f]
Long-term Weighted Average[16]		28—**39**	7.2—**9.1**	

[10] This table represents one possible way of achieving the long-term weighted average for sediment transport.
[11] Lower value in each range is for maintenance, higher (bold) value in each range is for improvement.
[12] Instantaneous peak flows within this range have occurred in these hydrologic categories since Blue Mesa Reservoir was closed. These observed instantaneous peaks are desired in the future in conjunction with meeting the flow targets. No specific peak flow is recommended to ensure continued variability among years.
[13] Lower number reflects the expected minimum peak flow when recommendations are met and the upper number reflects peak flows that have occurred since Blue Mesa Reservoir was closed. Peak flow is expected to occur within this range, but no specific value is provided to ensure variability among years.
[14] Expected peak flow when flow recommendations are met. Actual peak may exceed this level ensuring variability among years.
[15] Range of peak flows that have occurred since Blue Mesa Reservoir was closed. Peak flows are expected to continue to fall within this range when 18,500 cfs is not reached. No specific recommendation within this range is made to ensure variability among years.
[16] Weighted values equals days/year x expected occurrence (the sum of all weighted averages equals the long-term weighted average in days/year).