

Appendix D6
Estimated Conditions for
Upper Basin Wildlife Refuges

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1.0 Introduction

The Seedskadee, Browns Park, and Ouray National Wildlife Refuges (NWR), located in the Upper Basin, hold water rights that help to preserve the health of those refuges. The refuges' water rights are typically diversion rights, and the Colorado River Simulation System has the ability to track whether the requested diversion amount is present in reaches approximating the locations of the Upper Basin NWRs. The following sections present the method to estimate the flow conditions for the NWRs and the resulting estimated conditions.

2.0 Methodology

Historically, the NWRs' diversions vary annually based on hydrologic conditions, so for each refuge, the estimated conditions vary with hydrologic year type. The estimated diversions were developed based on the NWRs' state water rights and historical diversion records.

Approximately 20 years of annual water usage reports from the refuges maintained by the U.S. Fish and Wildlife Service were used to develop the estimated diversions. Monthly diversion records or a total annual diversion amount were reported in the water usage reports, depending on refuge and year. The full record of annual diversion amounts were ranked and then separated by exceedance probability to come up with diversion needs that vary with hydrologic year type. Wet, moderately wet, average, and dry year types were defined as 0 to 10 percent, 10 to 30 percent, 30 to 70 percent, and 70 to 100 percent exceedance probabilities, respectively. The full diversion right was used as the annual need in wet years. For other year types, the annual diversion amount was determined based on the middle exceedance probability for that year type—for example, the year with a 20 percent exceedance probability for the average wet year. Monthly needs were then computed based on the average historical monthly diversion pattern.

3.0 Estimated Conditions

The estimated conditions for Seedskadee, Browns Park, and Ouray NWRs are listed in tables D6-1, D6-2, and D6-3, respectively.

Colorado River Basin
Water Supply and Demand Study

TABLE D6-1
Estimated Conditions (acre-feet [af] per month) for the Seedskadee NWR

Year Type Exceedance	Dry 100–70%	Average 70–30%	Moderately Wet 30–10%	Wet 10–0%
January	250	300	360	700
February	250	300	360	700
March	1,300	1,700	1,900	3,650
April	1,600	2,000	2,300	4,450
May	2,060	2,550	2,700	5,700
June	1,640	2,040	2,330	4,600
July	900	1,150	1,300	2,500
August	700	850	1,200	2,200
September	850	1,000	1,200	2,200
October	450	570	650	1,300
November	0	0	0	0
December	0	0	0	0
Annual	10,000	12,460	14,300	28,000

TABLE D6-2
Estimated Conditions (af per month) for the Browns Park NWR

Year Type Exceedance	Dry 100–70%	Average 70–30%	Moderately Wet 30–10%	Wet 10–0%
January	90	130	200	320
February	90	130	200	310
March	460	680	1,100	1,615
April	560	830	1,300	1,970
May	720	1,070	1,700	2,520
June	570	850	1,340	2,020
July	320	480	750	1,130
August	240	360	570	855
September	220	330	520	800
October	230	340	520	810
November	0	0	0	0
December	0	0	0	0
Annual	3,500	5,200	8,200	12,350

TABLE D6-3
Estimated Conditions (af per month) for the Ouray NWR

Year Type Exceedance	Dry 100–70%	Average 70–30%	Moderately Wet 30–10%	Wet 10–0%
January	0	0	0	0
February	0	0	0	0
March	600	1,100	1,500	2,000
April	800	1,200	1,100	2,300
May	2,500	4,500	6,500	8,800
June	800	1,200	1,500	2,200
July	600	1,100	1,500	2,100
August	600	1,100	1,500	2,050
September	600	1,100	1,500	2,000
October	600	1,100	1,500	2,000
November	0	0	0	0
December	0	0	0	0
Annual	7,100	12,400	16,600	23,450