CLARK CANYON DAM AND RESERVOIR
OPERATIONS DECISION MAKING PROCESS

As with the other projects under Montana Area Office jurisdiction, operational decisions for Clark Canyon Dam and Reservoir are based on optimizing the benefits for the authorized project purposes, in a manner consistent with the operational objectives identified in the *Annual Operating Plan-Upper Missouri River Basin (AOP)*.

Although the authorized project purposes do not have a mandated order of priority, public safety and protection of human life and property typically remains the top priority from an operations perspective. During periods of extended drought, multiple operational objectives frequently result in competition for the same limited water supply. In these situations, Reclamation attempts to balance the impacts equitably amongst the competing objectives.

Much of water supply for projects in Montana, depends heavily on the mountain snowmelt which generally occurs during April through July. Prior to the beginning of the snowmelt runoff season, water managers are positioning their reservoirs at a level that will provide adequate storage space to store the spring runoff and prevent large releases downstream that could cause flooding. Once the spring runoff has peaked and streamflows begin to recede, the reservoirs are allowed to slowly fill and reach their peak levels by late spring or early summer. This would allow storage to be used later during the summer, fall, and winter to meet all the project benefits.

To be most successful in accomplishing this, many things such as climate and hydrologic conditions are closely monitored, analyzed and evaluated. Some of this data may include by not limited to daily and monthly precipitation, snow water equivalent that exists in the high elevation snowpack, streamflow flow rates, reservoir levels, and reservoir releases. Current and statistical data is closely monitored, analyzed, and discussed with several Local, State, and Federal Agencies.

Each month, beginning in January and continuing through June, seasonal runoff forecasts of the April-July runoff expected are prepared. This information is then fed into monthly reservoir and river operation models that provide valuable information to water users and various stakeholders to help them prepare for the coming year. This information is also made available to the public on Reclamation's website.

In addition, through years of experience, Reclamation has identified several operational considerations and reservoir elevation targets to help meet the operational objectives of many of its water projects. Below are some of the operational objectives in the operations for Clark Canyon Dam and Reservoir and the Beaverhead River:

1. After irrigation season is over, fall and winter releases are set to allow storage to reach content no higher than 154,195 acre-feet at elevation 5542.10 feet by March 1.

2. From inflow forecasts based primarily on the snow water content of the mountain snowpack, prepared during January through June, releases are adjusted to allow storage to fill to 174,367 acre-feet at elevation 5546.10 feet during late May or early June.

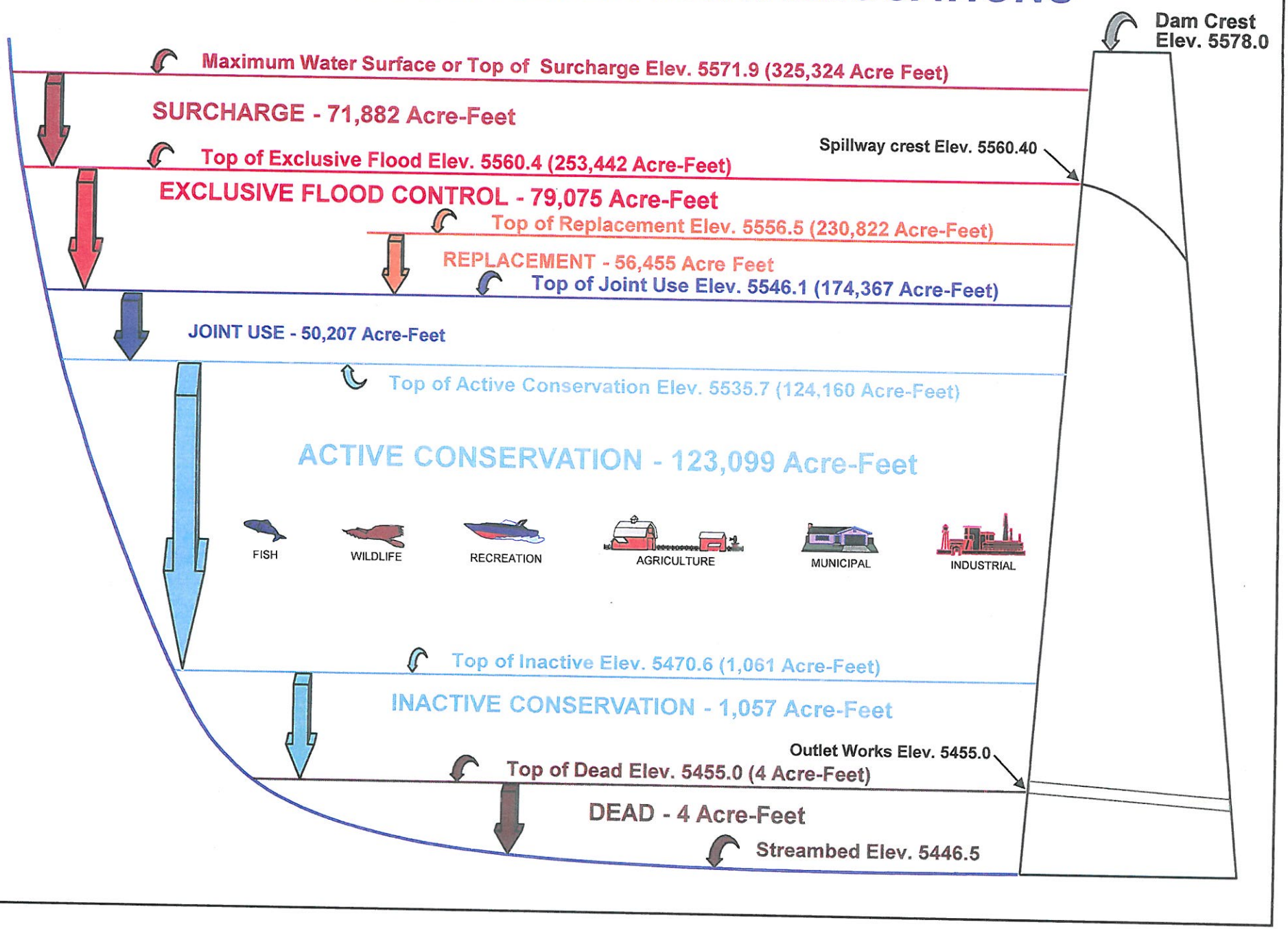
3. During May through September, reservoir releases are adjusted to meet downstream irrigation demands or to control storage in the exclusive flood pool if storage increases above the top of the joint use pool. If the Corps requests replacement storage, the reservoir is allowed to fill as high as 230,822 acre-feet at elevation 5556.50.

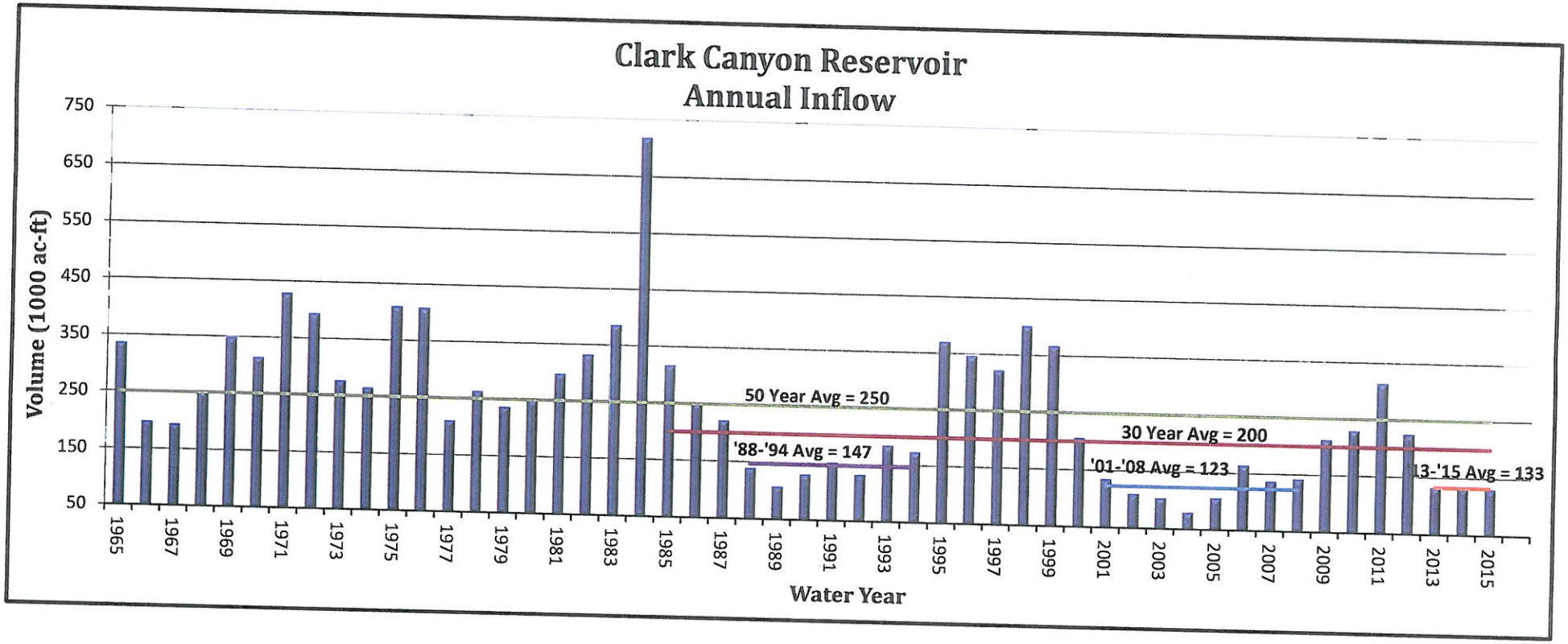
4. Fill the reservoir to the top of the joint-use pool (elevation 5546.1 feet) by late June/early July to maximize the available storage, thereby providing multipurpose benefits until the next runoff season.

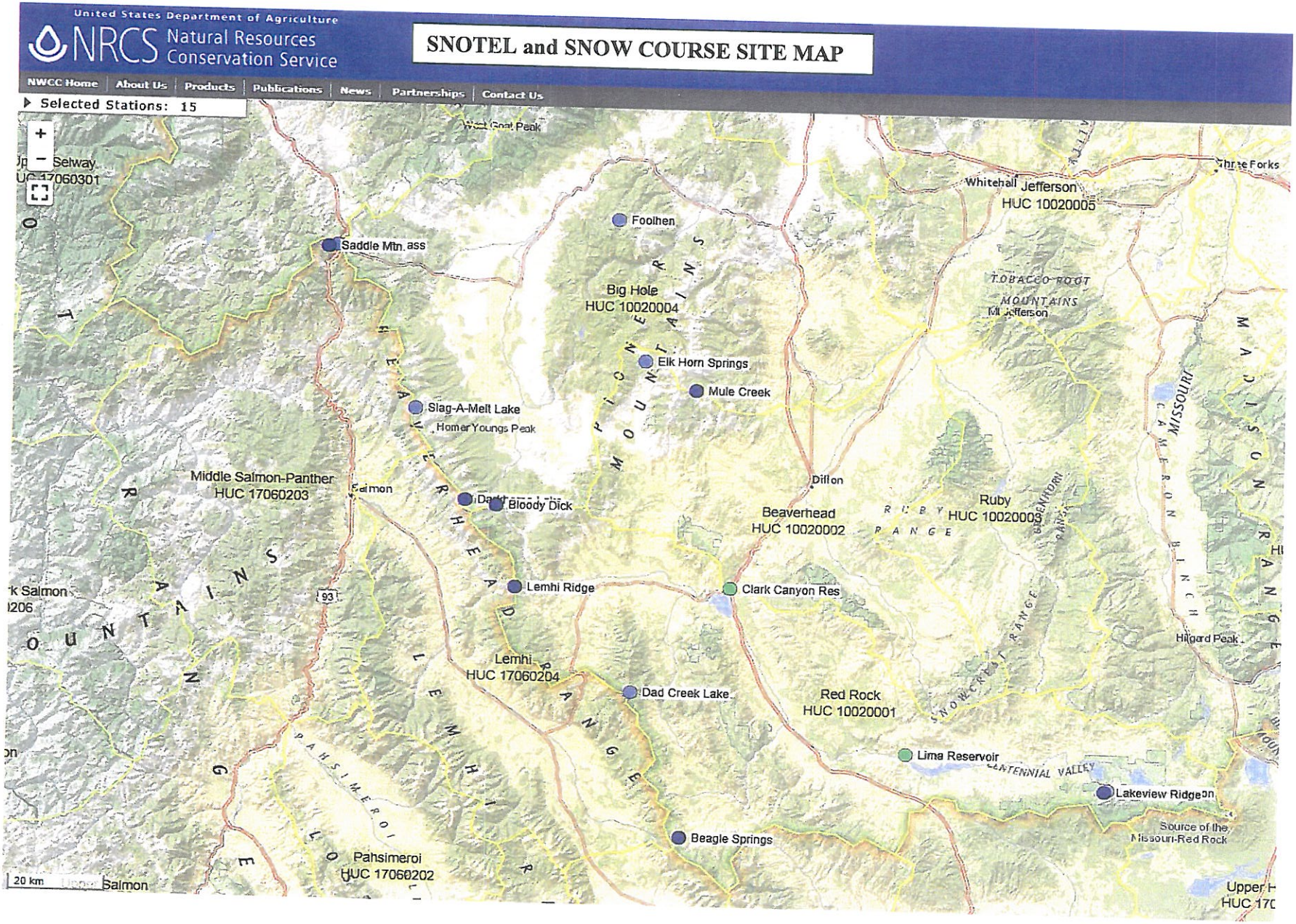
5. To protect the river fishery downstream of Clark Canyon Dam, whenever an adequate water supply is available, releases from Clark Canyon Dam will be maintained at rates to sustain flows in the Beaverhead River between 100-200 cfs. During below normal runoff years, it may be necessary to reduce release to the minimum flow of 25 cfs in the Beaverhead River below Clark Canyon Dam.

6. Whenever possible, stable flows are maintained during October through the spring to enhance the fish spawning activities. Large fluctuations in winter release changes will be avoided to reduce the potential for flooding as a result of ice jams.

CLARK CANYON RESERVOIR ALLOCATIONS




Clark Canyon Reservoir
Annual Inflow
Volume (1000 ac-ft)
750
650
550
450
350
250
150
50
50 Year Avg = 250
30 Year Avg = 200
'88-'94 Avg = 147
'01-'08 Avg = 123
13-'15 Avg = 133
1965
1967
1969
1971
1973
1975
1977
1979
1981
1983
1985
1987
1989
1991
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
Water Year


United States Department of Agriculture
NRCS Natural Resources Conservation Service
SNOTEL and SNOW COURSE SITE MAP
NWCC Home | About Us | Products | Publications | News | Partnerships | Contact Us
Selected Stations: 15
Selway
Saddle Mtn. ass
Foolhen
Big Hole
HUC 10020004
Elk Horn Springs
Mule Creek
Slag-A-Melt Lake
Homer Youngs Peak
Middle Salmon-Panther
HUC 17060203
Salmon
Bloody Dick
Dillon
Beaverhead
HUC 10020002
Ruby
HUC 10020003
Whitehall
Jefferson
HUC 10020005
Three Forks
Lemhi Ridge
Clark Canyon Res
Lemhi
HUC 17060204
Dad Creek Lake
Red Rock
HUC 10020001
Lima Reservoir
Lakeview Ridge
Source of the Missouri-Red Rock
Beagle Springs
Pahsimeroi
HUC 17060202
Hilgard Peak
20 km
Salmon

Clark Canyon Reservoir EA Winter Releases Guidelines

Water Year	July Inflow (af)	Aug. Inflow (af)	Sept. 1 Storage (af)	Total (af)	Water Year	Oct-March Avg. Actual Release (cfs)	Oct-March Avg. EA Release (cfs)
2000	15,900	13,400	61,985	91,285	2001	53	30
2001	13,600	9,790	32,610	56,000	2002	35	25
2002	10,590	8,870	12,087	31,547	2003	27	25
2003	8,760	7,740	11,164	27,664	2004	27	25
2004	6,000	6,120	21,213	33,333	2005	27	25
2005	14,200	12,910	37,466	64,576	2006	27	25
2006	19,910	13,000	59,270	92,180	2007	40	30
2007	14,800	10,790	59,957	85,547	2008	30	28
2008	14,770	10,990	57,940	83,700	2009	34	28
2009	19,440	16,020	147,881	183,341	2010	182	200+
2010	25,350	21,260	149,632	196,242	2011	240	200+
2011	41,520	25,710	182,992	250,222	2012	337	200+
2012	17,730	12,190	84,020	113,940	2013	52	43
2013	13,400	10,060	52,359	75,819	2014	25	25
2014	12,735	9,431	62,307	84,473	2015	30	28
2015	14,814				2016		

EA Guidelines Storage (af)	Winter Release (cfs)
< 80,000	25
80,000	25
85,000	28
90,000	30
95,000	33
100,000	35
105,000	38
110,000	40
115,000	43
120,000	45
125,000	48
130,000	50
135,000	58
140,000	67
145,000	75
150,000	83
155,000	92
160,000	100
>160,000	200+

5 cfs Over 7 Months = 2,100 acre-feet of Storage

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	Total
30 cfs	1,845	1,785	1,845	1,845	1,666	1,845	1,785	12,615
25 cfs	1,537	1,488	1,537	1,537	1,388	1,537	1,488	10,512
Difference	307	298	307	307	278	307	298	2,102