Appendix 21 Recreation Resources

Line items and numbers identified or noted as "No Action Alternative" represent the "Existing Conditions/No Project/No Action Condition" (described in Chapter 2 Alternatives Analysis). Table numbering may not be consecutive for all appendixes.



Contents

Appendix 21: Recreation Resources

- 21A Impact of Sites Reservoir Project Operations on Recreation-Day Benefit Values
 21B Impact of Sites Reservoir Project Operations on Usability of Reservoir Boat Ramps



Appendix 21A Impact of Sites Reservoir Project Operations on Recreation-Day Benefit Values

Line items and numbers identified or noted as "No Action Alternative" represent the "Existing Conditions/No Project/No Action Condition" (described in Chapter 2 Alternatives Analysis). Table numbering may not be consecutive for all appendixes.



Sites Reservoir Project Operations Impacts on Recreation-Day Benefit Values

Table 21A-1
San Luis Reservoir Recreation-Day Benefit Values with Sites Reservoir Operations^a

San Luis Reservoir		April-Sept	Surface	Benefit
Maximum Water Elevation (feet) =	544	Average	Area	Value
Maximum Water Elevation Surface Area (acres) =	12,700	Surface Area ^b	Ratio	Points
Existing Conditions/No Project/No Action Condition		8,742	0.688	4.0
Alternative A		8,704	0.685	3.5
Alternative B		8,723	0.687	4.0
Alternative C		8,628	0.679	3.0
Alternative D		8,721	0.687	4.0

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

Table 21A-2
Trinity Lake Recreation-Day Benefit Values with Sites Reservoir Operations^a

Trinity Luke Redication Bay Bene	ne raidee mi	iii Oitoo ittoooi roii	• por autono	
Trinity Lake		April-Sept	Surface	Benefit
Maximum Water Elevation (feet) =	2,370	Average	Area	Value
Maximum Water Elevation Surface Area (acres) =	16,335	Surface Area ^b	Ratio	Points
Existing Conditions/No Project/No Action Condition		12,386	0.758	13.0
Alternative A		12,590	0.771	15.0
Alternative B		12,603	0.772	15.0
Alternative C		12,636	0.774	16.0
Alternative D	_	12,429	0.761	13.5

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

Table 21A-3
Shasta Lake Recreation-Day Benefit Values with Sites Reservoir Operations^a

Shasta Lake		April-Sept	Surface	Benefit
Maximum Water Elevation (feet) =	1,067	Average	Area	Benefit Value Points
Maximum Water Elevation Surface Area (acres) =	29,740	Surface Area ^b	Ratio	Points
Existing Conditions/No Project/No Action Condition		24,109	0.811	28.5
Alternative A		24,514	0.824	33.0
Alternative B		24,580	0.826	33.0
Alternative C		24,590	0.827	33.0
Alternative D	•	24,136	0.812	28.5

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

^bAverage end-of-month surface area in acres.

^bAverage end-of-month surface area in acres.

^b Average end-of-month surface area in acres.

Table 21A-4

Lake Oroville Recreation-Day Benefit Values with Sites Reservoir Operations^a

Lake Oroville		April-Sept	Surface	Benefit
Maximum Water Elevation (feet) =	899	Average	Area	Value
Maximum Water Elevation Surface Area (acres) =	15,805	Surface Area ^b	Ratio	Points
Existing Conditions/No Project/No Action Condition		12,232	0.774	16.0
Alternative A		12,345	0.781	18.0
Alternative B		12,349	0.781	18.0
Alternative C		12,330	0.780	18.0
Alternative D	_	12,416	0.786	19.5

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

Table 21A-5
Folsom Lake Recreation-Day Benefit Values with Sites Reservoir Operations^a

Folsom Lake		April-Sept	Surface	Benefit
Maximum Water Elevation (feet) =	456	Average	Area	Value
Maximum Water Elevation Surface Area (acres) =	11,450	Surface Area ^b	Ratio	Points
Existing Conditions/No Project/No Action Condition		9,087	0.794	22.5
Alternative A		9,224	0.806	26.5
Alternative B		9,189	0.803	26.0
Alternative C		9,226	0.806	26.5
Alternative D		9,212	0.804	26.5

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

Table 21A-6
Sites Reservoir Recreation-Day Benefit Values^a

ORGO ROGGIVON ROC				
Sites Reservoir				
Maximum Water Elevation (feet) =	520			
Maximum Water Elevation Surface Area (acres) =	14,100	April-Sept	Surface	Benefit
Maximum Water Elevation (feet) =	480	Average	Area	Value
Maximum Water Elevation Surface Area (acres) =	12,400	Surface Area ^b	Ratio	Points
Alternative A (480 feet)		10,099	0.814	30.0
Alternative B (520 feet)		11,046	0.783	19.0
Alternative C (520 feet)		12,021	0.853	39.5
Alternative D (520 feet)		11,865	0.841	37.0

^aReservoir operation portion of the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14.

^bAverage end-of-month surface area in acres.

^bAverage end-of-month surface area in acres.

^bAverage end-of-month surface area in acres.

Impact of Sites Reservoir Project Operations on Recreation-Day Benefit Values

Table 21A-7
Reservoir Recreation-Day Benefit Values (Detailed Results)

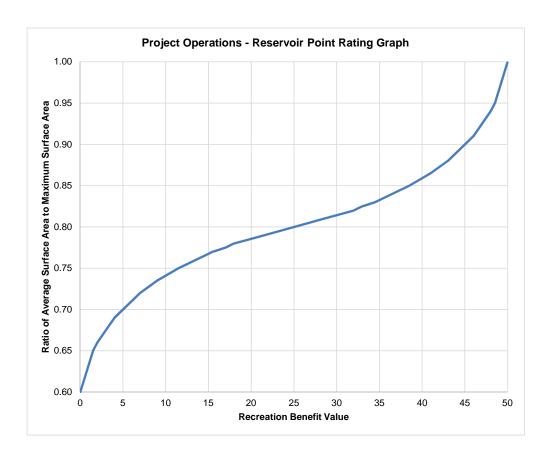
Center of Month Surface Area Average Ratio Point Surface Area			ı	Reservoir Recreation-Day	Benefit Values (De	etailed Results)	1	T	1	
SAN LUS RESERVOR Existing Condition 1 0,866 9,788 8,240 7,889 7,688 8,160 8,775 9,741 4,041 8,771 7,449 8,771 7,447 8,771 7,447 8,771 8,704 8,701 8,704 8,705 8,705 8,005 7,710 7,387 8,025 8,025 8,026 8,028 8,040E 8,033 8,215 7,777 7,472 8,114 8,071 8,704 8,7		April	May			August	September			Operation
Esisteng Condition 10,066 8,786 8,786 7,686 7,686 8,175 8,775 8,40 4.0				(End of Month Surfa	ce Area)			Average	Ratio	Points*
Alternative A 10,956 9,813 6,219 7,717 7,449 8,071 8,794 87AULEI 35.8 Alternative B 10,979 9,846 8,212 7,719 7,447 8,134 8,723 87AULEI 4.0 Alternative C 10,905 9,745 8,005 7,610 7,387 8,025 8,628 8/AULEI 4.0 Alternative C 11,905 9,833 8,215 7,727 7,427 8,114 8,721 8/AULEI 4.0 Alternative C 11,905 9,833 8,215 7,727 7,427 8,114 8,721 8/AULEI 4.0 Alternative A 10,906 9,813 8,215 7,727 7,449 8,071 8,704 8/AULEI 4.0 Alternative A 10,906 9,813 8,215 7,777 7,449 8,071 8,704 8/AULEI 4.0 Alternative A 10,906 9,813 8,219 7,777 7,449 8,071 8,704 8/AULEI 4.0 Alternative C 10,905 9,813 8,215 7,777 7,449 8,071 8,704 8/AULEI 4.0 Alternative C 10,905 9,813 8,215 7,777 7,449 8,071 8,704 8/AULEI 4.0 Alternative C 10,905 9,813 8,745 8,008 7,810 7,387 8,025 8,628 8/AULEI 4.0 Alternative C 10,905 9,704 8,704	SAN LUIS RESERVOIR									
Alternative B 10,979	Existing Condition	10,866	9,788	8,246	7,886	7,698	8,166	8,775	#VALUE!	4.0
Alternative C 10,006 9,746 8,005 7,610 7,387 8,025 8,628 8/ALUEI 3.0 Alternative D 10,966 9,833 8,215 7,727 7,472 8,114 8,721 8/ALUEI 4.0 Alternative A 10,968 9,813 8,219 7,717 7,449 8,071 8,704 8/ALUEI 4.0 Alternative A 10,966 9,813 8,219 7,717 7,449 8,071 8,704 8/ALUEI 3.5 Alternative C 10,965 9,745 8,095 7,610 7,387 8,025 8,628 8/ALUEI 4.0 Alternative C 10,965 9,745 8,095 7,610 7,387 8,025 8,628 8/ALUEI 4.0 Alternative C 10,965 9,745 8,095 7,610 7,387 8,025 8,628 8/ALUEI 4.0 Alternative C 10,966 9,833 8,215 7,727 7,472 8,114 8,721 8/ALUEI 4.0 Alternative C 10,966 9,833 8,215 7,727 7,472 8,114 8,721 8/ALUEI 4.0 Alternative A 12,700 acres 12,700 acres 12,700 acres 12,700 acres 12,700 acres 12,307 11,581 10,946 12,256 8/ALUEI 12,001 Alternative A 13,308 13,308 13,308 13,311 12,504 11,867 11,220 12,256 8/ALUEI 15,001 Alternative D 13,477 13,245 13,009 12,308 11,631 10,966 12,256 8/ALUEI 15,001 Alternative D 13,477 13,245 13,009 12,308 11,631 10,966 12,286 8/ALUEI 15,000 Alternative A 13,308 13,308 13,301 12,303 11,594 10,965 12,286 8/ALUEI 15,000 Alternative A 13,308 13,308 13,301 12,308 11,631 10,966 12,286 8/ALUEI 15,000 Alternative A 13,308 13,308 13,301 12,308 11,631 10,966 12,286 8/ALUEI 15,000 Alternative A 13,308 13,308 13,308 13,301 12,308 11,631 10,966 12,286 8/ALUEI 15,000 Alternative A 13,308 13,308 13,301 12,308 11,631 10,966 12,286 8/ALUEI 13,000 12,286 11,631 10,966 12,286 12,286 12,286 12,286 12,286 12,286 12,286 12,286 12,286 12,286 12,286 12,28	Alternative A	10,956	9,813	8,219	7,717	7,449	8,071	8,704	#VALUE!	3.5
Allemantive D 10,985 9,333 8,215 7,727 7,472 8,114 8,721 MALUE 4.0	Alternative B	10,979	9,845	8,212	7,719	7,447	8,134	8,723	#VALUE!	4.0
No Action Alternative 10,908 9,799 8,273 7,338 7,568 8,067 8,742 9YALUEI 4.0 Alternative A 10,958 9,313 8,219 7,717 7,449 8,071 8,704 9YALUEI 3.5 Alternative A 10,958 9,313 8,219 7,717 7,449 8,071 8,704 9YALUEI 3.5 Alternative C 10,905 9,745 8,095 7,610 7,387 8,025 8,288 9YALUEI 3.0 Alternative D 10,965 9,333 8,215 7,727 7,472 8,114 8,721 9YALUEI 3.0 Alternative C 10,905 9,333 8,215 7,727 7,472 8,114 8,721 9YALUEI 3.0 Alternative C 12,700 acres 12,700 acre	Alternative C	10,905	9,745	8,095	7,610	7,387	8,025	8,628	#VALUE!	3.0
Alternative A 10,956 9,813 8,219 7,717 7,449 8,071 8,704 8,704 8,704 8,006 7,407 8,104 8,006 10,079 9,845 8,212 7,719 7,447 8,134 8,723 8,025 8,823 8,041UE 4.0	Alternative D	10,965	9,833	8,215	7,727	7,472	8,114	8,721	#VALUE!	4.0
Alternative B 10,979	No Action Alternative	10,908	9,799	8,273	7,838	7,568	8,067	8,742	#VALUE!	4.0
Alternative C 10,905 9,745 8,095 7,610 7,387 8,025 8,828 #VALUE! 3.0	Alternative A	10,956	9,813	8,219	7,717	7,449	8,071	8,704	#VALUE!	3.5
Alemanture D	Alternative B	10,979	9,845	8,212	7,719	7,447	8,134	8,723	#VALUE!	4.0
Maximum Water Elevation S-44 feet	Alternative C	10,905	9,745	8,095	7,610	7,387	8,025	8,628	#VALUE!	3.0
MWE Surface Area 12,700 acres 12,700 acres 12,700 acres 12,801 12,807 11,811 10,946 12,356 87ALUEI 12.0	Alternative D	10,965	9,833	8,215	7,727	7,472	8,114	8,721	#VALUE!	4.0
Existing Condition 13,173 13,146 12,981 12,307 11,581 10,946 12,356 #VALUEI 12,007 11,581 10,946 12,356 #VALUEI 15,00 Alternative A 13,388 13,358 13,191 12,534 11,867 11,210 12,603 #VALUEI 15,00 Alternative C 13,431 13,400 13,232 12,583 11,888 11,273 12,636 #VALUEI 15,00 Alternative C 13,431 13,400 13,232 12,583 11,888 11,273 12,636 #VALUEI 15,00 Alternative C 13,431 13,400 13,232 12,583 11,898 11,273 12,636 #VALUEI 15,00 Alternative C 13,431 13,400 13,245 13,069 12,336 11,594 10,985 12,386 #VALUEI 15,00 Alternative C 13,431 13,400 13,232 12,536 11,594 10,985 12,386 #VALUEI 15,00 Alternative C 13,431 13,400 13,232 12,534 11,840 11,228 12,590 #VALUEI 15,00 Alternative C 13,431 13,400 13,232 12,534 11,867 11,210 12,603 #VALUEI 15,00 Alternative D 13,277 13,245 13,069 12,388 11,898 11,273 12,636 #VALUEI 15,00 Alternative D 13,277 13,245 13,069 12,388 11,898 11,273 12,636 #VALUEI 15,00 Alternative D 13,277 13,245 13,069 12,388 11,898 11,273 12,636 #VALUEI 15,00 Alternative D 13,277 13,245 13,069 12,388 11,631 10,986 12,429 #VALUEI 13,00 Alternative D 13,277 13,245 13,069 12,388 11,631 10,986 12,429 #VALUEI 13,00 Alternative D 13,277 13,245 13,069 12,388 11,631 10,986 12,429 #VALUEI 13,00 Alternative B 27,231 27,460 26,016 23,731 21,967 20,996 24,580 #VALUEI 33,00 Alternative B 27,231 27,460 26,016 23,731 21,967 20,996 24,580 #VALUEI 33,00 Alternative C 27,552 27,447 26,117 23,732 21,982 21,031 24,590 #VALUEI 33,00 Alternative C 26,994 27,105 25,614 23,681 21,389 20,988 24,514 #VALUEI 33,00 Alternative C 26,994 27,105 25,614 23,681 21,389 20,988 24,514 #VALUEI 33,00 Alternative C 27,252 27,447 26,117 23,732 21,982 21,095 20,986 24,514 #VALUEI 33,00 Alternative C 27,252 27,447 26,117 23,731 21,967 20,996 24,580 #VALUEI 33,00 Alternative C 27,252 27,447 26,117 23,732 21,982 20,988 24,514 #VALUEI 33,00 Alternative C 27,252 27,447 26,117 23,732 21,982 20,988 24,514 #VALUEI 33,00 Alternative C 27,252 27,447 26,117 23,731 21,967 20,996 24,580 #VALUEI 33,00 Alternative C 27,252 27,447 26,117 23,731 21,967 20,996 24,580 #VA	Maximum Water Elevation	544 feet								
Existing Condition 13,173 13,146 12,981 12,307 11,581 10,946 12,336 #VALUEI 12,001 13,401 13,338 13,358 13,191 12,534 11,840 11,228 12,590 #VALUEI 15,001 13,401 13,373 13,212 12,554 11,867 11,210 12,603 #VALUEI 15,001 13,401 13,400 13,232 12,538 11,898 11,273 12,636 #VALUEI 16,001 13,277 13,245 13,069 12,368 11,631 10,986 12,336 #VALUEI 13,001 13,232 12,533 11,898 11,273 12,636 #VALUEI 13,001 13,245 13,069 12,368 11,591 10,955 12,386 #VALUEI 13,001 13,373 13,212 12,534 11,840 11,228 12,590 #VALUEI 15,001 13,373 13,212 12,534 11,840 11,228 12,590 #VALUEI 15,001 13,401 13,373 13,212 12,554 11,867 11,210 12,603 #VALUEI 15,001 13,401 13,373 13,212 12,554 11,867 11,210 12,603 #VALUEI 15,001 13,401 13,373 13,245 13,969 12,368 11,631 10,966 12,429 #VALUEI 15,001 13,277 13,245 13,069 12,368 11,631 10,966 12,429 #VALUEI 13,001 13,277 13,245 13,069 12,368 11,631 10,966 12,429 #VALUEI 13,001 13,0	MWE Surface Area	12,700 acres								
Alternative A 13.388 13.388 13.388 13.191 12.534 11.840 11.228 12.590 #VALUE! 15.0 Alternative B 13.401 13.373 13.212 12.554 11.867 11.210 12.603 #VALUE! 15.0 Alternative C 13.431 13.400 13.232 12.583 11.898 11.273 12.636 #VALUE! 15.0 Alternative D 13.277 13.245 13.069 12.368 11.631 10.986	TRINITY LAKE									
Alternative B 13,401 13,373 13,212 12,554 11,867 11,210 12,603 #VALUE 15,0	Existing Condition	13,173	13,146	12,981	12,307	11,581	10,946	12,356	#VALUE!	12.0
Milemative B 13,401 13,373 13,212 12,554 11,867 11,210 12,603 #VALUE 15,0	Alternative A	13,388	13,358	13,191	12,534	11,840	11,228	12,590	#VALUE!	15.0
Alternative C 13,431 13,400 13,232 12,583 11,898 11,273 12,636 #VALUEI 16.0 Alternative D 13,277 13,245 13,069 12,368 11,631 10,986 1.1.273 12,636 #VALUEI 15.0 NO Action Alternative M 13,219 13,188 13,021 12,336 11,594 10,955 12,386 #VALUEI 13.0 Alternative B 13,401 13,373 13,212 12,554 11,867 11,210 12,603 #VALUEI 15.0 Alternative C 13,431 13,400 13,232 12,583 11,898 11,273 12,636 #VALUEI 16.0 Alternative D 13,277 13,245 13,069 12,368 11,631 10,986 12,429 #VALUEI 15.0 Alternative D 13,277 13,245 13,069 12,368 11,631 10,986 12,429 #VALUEI 13.5 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUEI 33.0 Alternative B 27,231 27,460 26,117 23,732 21,962 21,031 24,590 #VALUEI 33.0 Alternative C 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative B 27,231 27,460 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative C 27,755 27,447 26,117 23,732 21,962 21,031 24,590 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,457 20,996 24,590 #VALUEI 33.0 Alternative D 26,976 27,447 26,117 23,735 20,996 24,590 #VALUEI 33.0 Alternative D 27,252 27,447 26,117 23,735 20,996 24,590 #VALUEI 33.0	Alternative B				12,554	11,867	11,210		#VALUE!	15.0
Alternative D 13,277 13,245 13,069 12,366 11,631 10,986 13.55 No Action Alternative 13,219 13,188 13,021 12,336 11,594 10,955 12,386 #VALUE! 13.0 Alternative A 13,388 13,358 13,191 12,534 11,840 11,228 12,590 #VALUE! 15.0 Alternative B 13,401 13,373 13,212 12,554 11,867 11,210 12,603 #VALUE! 15.0 Alternative C 13,431 13,400 13,232 12,583 11,898 11,273 12,636 #VALUE! 16.0 Alternative D 13,277 13,245 13,069 12,368 11,631 10,986 12,429 #VALUE! 13.5 Maximum Water Elevation 2,370 feet WWE Surface Area 16,335 acres SHASTA LAKE SHABSTA LAKE SHABSTA LAKE Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,455 20,484 24,136 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 26,994 27,085 25,614 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,455 20,484 24,136 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,455 20,484 24,136 #VALUE! 33.0 Alternative D 26,994 27,105 25,614 23,168 21,388 20,385 24,109 #VALUE! 33.0 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative A 27,181 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative A 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0	Alternative C					11.898			#VALUE!	16.0
Alternative A 13,388 13,358 13,191 12,534 11,840 11,228 12,590 #VALUE! 15.0 Alternative B 13,401 13,373 13,212 12,554 11,867 11,210 12,603 #VALUE! 15.0 Alternative C 13,431 13,400 13,232 12,583 11,898 11,273 12,636 #VALUE! 16.0 Alternative D 13,277 13,245 13,069 12,368 11,631 10,986 12,429 #VALUE! 13.5 Maximum Water Elevation 2,370 feet WWE Surface Area 16,335 acres SHASTA LAKE Existing Condition 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative D 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 27,252 27,447 26,117 23,735 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative D 27,252 27,447 26,117 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative D 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0								, , , , ,		13.5
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Maximum Water Elevation 2,370 feet	Alternative C	13,431	13,400	13,232	12,583	11,898	11,273	12,636	#VALUE!	16.0
SHASTA LAKE Existing Condition 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 28.5 Alternative A 27,181 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 28.5 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 28.5 Alternative A 27,105 26,021 23,681 21,388 20,385 24,109 #VALUE! 28.5 Alternative A 27,181 27,460 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative C 30.0 41.09 #VALUE! 33.0 41.09 #VALUE! 33.0 41.09 41.09 #VALUE! 33.0 41.09 41.09 #VALUE! 33.0 41.09 4	Alternative D	13,277	13,245	13,069	12,368	11,631	10,986	12,429	#VALUE!	13.5
SHASTA LAKE SHASTA LAKE SHASTA LAKE SHASTA LAKE SING Condition 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 28.5 Alternative A 27,181 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 28.5 Alternative A 27,105 25,614 23,168 21,388 20,385 24,109 #VALUE! 28.5 Alternative A 27,181 27,460 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0	Maximum Water Elevation	2,370 feet								
Existing Condition 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 28.5 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 28.5 No Action Alternative 26,994 27,105 25,614 23,168 21,388 20,385 24,109 #VALUE! 28.5 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0	MWE Surface Area	16,335 acres								
Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 28.5 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0	SHASTA LAKE									
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Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 28.5	Alternative A	27,181	27,375	26,021	23,641	21,899	20,968	24,514	#VALUE!	33.0
Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUEI 33.0 Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUEI 28.5	Alternative B	27,231	27,460	26,105	23,731	21,957	20,996	24,580	#VALUE!	33.0
Alternative D 26,976 27,080 25,618 23,211 21,445 20,484 24,136 #VALUE! 28.5 No Action Alternative 26,994 27,105 25,614 23,168 21,388 20,385 24,109 #VALUE! 28.5 Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0	Alternative C								#VALUE!	33.0
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Alternative A 27,181 27,375 26,021 23,641 21,899 20,968 24,514 #VALUE! 33.0 Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0	No Action Alternative	26,994	27,105	25,614	23,168	21,388	20,385	24,109	#VALUE!	28.5
Alternative B 27,231 27,460 26,105 23,731 21,957 20,996 24,580 #VALUE! 33.0 Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0		· · · · · · · · · · · · · · · · · · ·	,	· ·	•	·			+	33.0
Alternative C 27,252 27,447 26,117 23,732 21,962 21,031 24,590 #VALUE! 33.0										33.0
				· ·			,			33.0
20,000 2,000 20,										
	,	20,070	21,000	20,010	20,211	21,440	20,707	24,100	# V7 (EGE:	20.0

Maximum Water Elevation MWE Surface Area	1,067 feet 29,740 acres 13,560 13,635 13,621 13,619	14,016 14,106	June (End of Month Surfar	July ce Area)	August	September	Average	Ratio	Operation Points*
AKE OROVILLE Existing Condition Alternative A Alternative B Alternative C	29,740 acres 13,560 13,635 13,621						- menuge		
AKE OROVILLE Existing Condition Alternative A Alternative B Alternative C	29,740 acres 13,560 13,635 13,621								
AKE OROVILLE Existing Condition Alternative A Alternative B Alternative C	13,560 13,635 13,621								
Existing Condition Alternative A Alternative B Alternative C	13,635 13,621							1	
Existing Condition Alternative A Alternative B Alternative C	13,635 13,621		<u> </u>					1	
Alternative A Alternative B Alternative C	13,635 13,621		13,636	11,939	10,871	9,965	12,331	#VALUE!	18.0
Alternative B Alternative C	13,621		13,671	11,966	10.857	9,837	12,345	#VALUE!	18.0
Alternative C	· · · · · · · · · · · · · · · · · · ·	14,094	13,686	12,008	10,864	9,823	12,349	#VALUE!	18.0
		14,092	13,653	11,955	10,847	9,811	12,330	#VALUE!	18.0
	13,688	14,147	13,756	12,066	10,927	9,911	12,416	#VALUE!	19.5
	,	,	,	12,000		-,	1=,		
No Action Alternative	13,507	13,966	13,553	11,845	10,745	9,776	12,232	#VALUE!	16.0
Alternative A	13,635	14,106	13,671	11,966	10,857	9,837	12,345	#VALUE!	18.0
Alternative B	13,621	14,094	13,686	12,008	10,864	9,823	12,349	#VALUE!	18.0
Alternative C	13,619	14,092	13,653	11,955	10,847	9,811	12,330	#VALUE!	18.0
Alternative D	13,688	14,147	13,756	12,066	10,927	9,911	12,416	#VALUE!	19.5
	.0,000	,	.5,.55	.2,000	.0,02.	0,0	.2,		
Maximum Water Elevation	899 feet								
MWE Surface Area	15,805 acres								
OLSOM LAKE	10,000 00100								
Existing Condition	9,505	10,249	10.045	9,082	8.447	7,734	9,177	#VALUE!	25.0
Alternative A	9,528	10,252	10,046	9,194	8,497	7,826	9,224	#VALUE!	26.5
Alternative B	9,496	10,207	10,017	9,121	8,454	7,841	9,189	#VALUE!	26.0
Alternative C	9,520	10,245	10,059	9,160	8,515	7,854	9,226	#VALUE!	26.5
Alternative D	9,507	10,208	10,030	9,138	8,495	7,891	9,212	#VALUE!	26.5
itemative B	0,007	10,200	10,000	0,100	0,400	7,001	0,212	"VILUE.	20.0
No Action Alternative	9.478	10,219	9.984	8.943	8.292	7,603	9,087	#VALUE!	22.5
Alternative A	9,528	10,252	10,046	9,194	8,497	7,826	9,224	#VALUE!	26.5
Alternative B	9,496	10,207	10,017	9,121	8,454	7,841	9,189	#VALUE!	26.0
Alternative C	9,520	10,245	10,059	9,160	8,515	7,854	9,226	#VALUE!	26.5
Alternative D	9,507	10,208	10,030	9,138	8,495	7,891	9,212	#VALUE!	26.5
incinative B	0,001	10,200	10,000	0,100	0,100	1,001	0,2.12	# 17 LEG E.	20.0
Maximum Water Elevation	456 feet								
MWE Surface Area	11,450 acres								
2 54.145571.54	11,100 00100								
SITES RESERVOIR									
Existing Condition	0	0	0	0	0	0	0	#VALUE!	0.0
Alternative A	10,936	10,754	10.484	9,897	9.486	9,036	10,099	#VALUE!	30.0
Alternative B	11,793	11,671	11,331	10,807	10,501	10,175	11,046	#VALUE!	19.0
Alternative C	12,699	12,572	12,336	11,889	11,489	11,141	12,021	#VALUE!	39.5
Alternative D	12,717	12,586	12,159	11,595	11,223	10,909	11,865	#VALUE!	37.0
	,. 11	. 2,000	12,100	,000	,220	. 5,500	,000		57.0
No Action Alternative	0	0	0	0	0	0	0	#VALUE!	0.0
Alternative A	10,936	10,754	10,484	9,897	9,486	9,036	10,099	#VALUE!	30.0
Alternative B	11,793	11,671	11,331	10,807	10,501	10,175	11,046	#VALUE!	19.0
Alternative C	12,699	12,572	12,336	11,889	11,489	11,141	12,021	#VALUE!	39.5
Alternative D	12,717	12,586	12,159	11,595	11,223	10,909	11,865	#VALUE!	37.0
	12,111	12,000	12,100	11,000	11,220	10,000	11,000	"VILUE.	01.0
Maximum Water Elevation	520 feet		Alternatives B, C, and D						
MWE Surface Area	14,100 acres								
534007404	. 4, 100 00100		<u> </u>						
Maximum Water Elevation	480 feet		Alternative A					 	
MWE Surface Area	12,400 acres		, morridayo / t						

^{*}Operations points for the recreation-day benefit value obtained from Project Operations – Reservoir Point Rating Graph from California Department of Parks and Recreation (California State Parks). 1967 (with Revisions to 1971). Water Project Recreation Planning Manual. Measurement of Benefits, Sections 6400 6411.14. Note:

MWE = maximum water elevation

Value	Ratio	•
()	0.600
1.5	5	0.650
:	2	0.660
;	3	0.675
4	4	0.690
	7	0.720
9	9	0.735
11.	5	0.750
14.	5	0.765
15.	5	0.770
17	7	0.775
18	3	0.780
21.	5	0.790
2	5	0.800
28.	5	0.810
32	2	0.820
33	3	0.825
34.	5	0.830
35.	5	0.835
38.	5	0.850
4	-	0.865
43		0.880
46	ŝ	0.910
4	7	0.925
48	-	0.940
48.	-	0.950
50)	1.000





Appendix 21B Impact of Sites Reservoir Project Operations on Usability of Reservoir Boat Ramps

Line items and numbers identified or noted as "No Action Alternative" represent the "Existing Conditions/No Project/No Action Condition" (described in Chapter 2 Alternatives Analysis). Table numbering may not be consecutive for all appendixes.



Sites Reservoir Project Operations Impacts on Boat Ramp Accessibility

Table 21B-1 Number of Years and Months Boat Ramps at San Luis Reservoir are Not Usable Due to Sites Reservoir Operations

Name of Boat Ramp	Bottom Elevation (feet)	Existing Conditions/No Project/No Action Condition			Alternative A			Alternative B			Alternative C			Alternative D		
		Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Dinosaur Point	378	33	93	18.9%	35	91	18.5%	32	90	18.3%	36	102	20.7%	33	95	19.3%
Basalt Boat Ramp	340	3	4	0.8%	1	1	0.2%	3	3	0.6%	1	1	0.2%	2	4	0.8%
Total Months Dewatered	_		97			92			93			103			99	
Percent Change in Dewatering Compa	ared to the Existing Conditions/No Project/No Action Condition					-5.2%			-4.1%			6.2%			2.1%	

Table 21B-2

Number of Years and Months Boat Ramps at Trinity Lake are Not Usable Due to Sites Reservoir Operations

		Existing Conditions/No Project/No Action Condition			Alternative A			Alternative B			Alternative C			Alternative D		
Name of Boat Ramp	Bottom Elevation (feet)	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Stuart Fork	2,338	65	301	61.2%	64	292	59.3%	64	290	58.9%	64	291	59.1%	65	305	62.0%
Clark Springs	2,324	58	249	50.6%	55	237	48.2%	56	235	47.8%	55	235	47.8%	59	250	50.8%
Bowerman	2,323	57	246	50.0%	55	235	47.8%	56	234	47.6%	55	231	47.0%	58	245	49.8%
Fairview	2,313	50	213	43.3%	50	199	40.4%	50	201	40.9%	50	195	39.6%	51	215	43.7%
Trinity Center	2,300	48	178	36.2%	44	160	32.5%	42	154	31.3%	45	154	31.3%	48	176	35.8%
Cedar Stock	2,230	11	37	7.5%	10	33	6.7%	10	36	7.3%	10	33	6.7%	11	37	7.5%
Minersville	2,170	3	5	1.0%	1	1	0.2%	1	2	0.4%	1	1	0.2%	1	1	0.2%
Total Months Dewatered			1,229			1,157			1,152			1,140			1,229	
Percent Change in Dewatering Comp	pared to the Existing Conditions/No Project/No Action Condition		-			-5.9%			-6.3%			-7.2%			0.0%	

Table 21B-3
Number of Years and Months Boat Ramps at Shasta Lake are Not Usable Due to Sites Reservoir Operations

Name of Boat Ramp	Bottom Elevation (feet)	Existing Conditions/No Project/No Action Condition			Alternative A			Alternative B			Alternative C				Alternative D		
Name of Boat Namp	` ,	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	
Bailey Cove	1,017	67	202	41.1%	61	182	37.0%	63	181	36.8%	61	181	36.8%	60	178	36.2%	
Antlers	992	33	103	20.9%	27	88	17.9%	26	87	17.7%	27	86	17.5%	25	83	16.9%	
Hirz Bay	972	19	71	14.4%	16	58	11.8%	15	51	10.4%	16	54	11.0%	15	54	11.0%	
Packers Bay	952	13	50	10.2%	11	39	7.9%	10	39	7.9%	11	38	7.7%	11	40	8.1%	
Silverthorn Marina	942	11	41	8.3%	9	29	5.9%	9	34	6.9%	8	26	5.3%	9	29	5.9%	
Digger Bay Marina	937	11	37	7.5%	8	27	5.5%	8	29	5.9%	8	24	4.9%	8	25	5.1%	
Sugarloaf	907	8	23	4.7%	8	18	3.7%	6	17	3.5%	6	13	2.6%	6	14	2.8%	
Bridge Bay Resort	882	7	16	3.3%	5	10	2.0%	5	11	2.2%	4	9	1.8%	5	9	1.8%	
Centimudi/Jones Valley	857	5	11	2.2%	4	8	1.6%	5	8	1.6%	2	4	0.8%	1	2	0.4%	
Total Months Dewatered			554			459			457			435			434		
Percent Change in Dewatering Comp.	ared to the Existing Conditions/No Project/No Action Condition		-			-17.1%			-17.5%			-21.5%			-21.7%		

Table 21B-4
Number of Years and Months Boat Ramps at Lake Oroville are Not Usable Due to Reservoir Operations

Name of Boat Ramp	Bottom Elevation (feet)	Existing Conditions/No Project/No Action Condition			Alternative A				Alternative I	В	Alternative C			Alternative D		
		Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Loafer Creek	775	46	130	26.4%	44	123	25.0%	43	123	25.0%	41	119	24.2%	42	118	24.0%
Enterprise	750	34	97	19.7%	35	89	18.1%	34	92	18.7%	34	92	18.7%	32	83	16.9%
Lime Saddle	702	20	52	10.6%	18	47	9.6%	19	46	9.3%	20	48	9.8%	18	40	8.1%
Spillway	695	19	50	10.2%	17	42	8.5%	18	43	8.7%	19	46	9.3%	14	35	7.1%
Bidwell Canyon	660	9	20	4.1%	7	18	3.7%	5	11	2.2%	7	17	3.5%	10	24	4.9%
Total Months Dewatered			349			319			315			322			300	
Percent Change in Dewatering Compared to the Existing Conditions/No Project/No Action Condition			-			-8.6%			-9.7%			-7.7%			-14.0%	

Table 21B-5 Number of Years and Months Boat Ramps at Folsom Lake are Not Usable Due to Reservoir Operations

Name of Boat Ramp	Bottom Elevation (feet)	Existing Conditions/No Project/No Action Condition			Alternative A			Alternative B			Alternative C			Alternative D		
		Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Rattlesnake Bar	425	46	155	31.5%	38	136	27.6%	42	140	28.5%	35	131	26.6%	36	135	27.4%
Folsom Point	408	30	90	18.3%	26	78	15.9%	25	78	15.9%	26	79	16.1%	25	79	16.1%
Folsom Lake Marina	395	14	44	8.9%	16	37	7.5%	12	39	7.9%	14	35	7.1%	13	40	8.1%
Hobie Cove	375	4	14	2.8%	4	11	2.2%	3	13	2.6%	5	11	2.2%	4	12	2.4%
Low Water	370	4	14	2.8%	3	10	2.0%	3	12	2.4%	3	9	1.8%	3	10	2.0%
Total Months Dewatered			317			272			282			265			276	
Percent Change in Dewatering Compared to the Existing Conditions/No Project/No Action Condition			-			-14.2%			-11.0%			-16.4%			-12.9%	

Table 21B-6

Number of Years and Months Boat Ramps at Sites Reservoir are Not Usable Due to Reservoir Operations

		Alternative A			Alternative B			Alternative C			Alternative D		
	Bottom		IWS=480 fe	et	ı	NWS=520 fe	et	NWS=520 feet			NWS=520 feet		
Name of Boat Ramp		Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months		Number of Years	Number of Months	Percent of Months	Number of Years	Number of Months	Percent of Months
Stone Corral	400	17	75	15.2%	16	80	16.3%	13	51	10.4%	14	64	13.0%
Saddle Dam	420	28	111	22.6%	23	108	22.0%	14	72	14.6%	15	74	15.0%
Total Months Dewatered			186			188			123			138	
Percent Change in Dewatering Compared to Alternative A			-			1.1%			-33.9%			-25.8%	
Percent Change in Dewatering Compared to Alternative B			-			-			-34.6%			-26.6%	
Percent Change in Dewatering Compared to Alternative C			-			-			-			12.2%	

NWS = normal water surface elevation

