Table 1. Wetland units within the Bear River Migratory Bird Refuge

Habitat	Area (acres)	Description
Wetland Marshes	29,259	Account for the Refuge's largest water needs. Varying water levels are used to dictate the types of plants and animal communities for individual units of this type.
Saltair Mudflat	38,064	Habitat consisting of highly saline soils and nearly barren of vegetation. Management of the vegetated mudflats requires the area to be inundated with up to 2 inches of surface water during seasonal high river flows or heavy precipitation.
Wet Meadow	374	Habitat consisting of primarily sedges and rushes.
Riparian Habitat	45.5	Stream bank habitat along the Bear River channel.
Alkali Knolls	522	Abrupt mounds consisting of forbs, grasses, shrubs, and bare ground.
Alkali Bottoms	973	Similar vegetation to the knolls, the bottoms low-lying characteristic provides nesting for waterfowl species.
Salt Meadows	2,625	Heavily vegetated communities that consist of sedges, rushes and saltgrasses.
Dikes and Levees	791	Primarily for impoundment of water within units. These also provide a vegetation community, which is dominated by forbs.

Table 2. Management tasks of high water use habitat units

Habitat	Management Tasks	Constraint
Wetland Marshes	Managing salinity levels by flushing units with fresh water	Timing and quantity of water from the Bear River
Saltair Mudflat	Spring drawdown	Risk of not being able to refill in summer
Wet Meadows	Maintain water supply and prescribe grazing	Timing and quantity of water from the Bear River
Streambanks	Treat tamarisk to obtain rich native plant communities.	Cost of treatment chemicals and equipment

Table 3. Monthly delivery targets for the BRMBR

Month	Target Delivery (ac-ft)
Jan	-
Feb	4,258
Mar	60,884
Apr	59,181
May	61,309
Jun	46,843
Jul	50,240
Aug	43,002
Sep	54,497
Oct	42,150
Nov	3,406
Dec	-

Table 4. Performance metrics for each stakeholder metric under the reference scenario and each alternative.

Stakeholder	Performance Metric	Objective	Reference	Above Cutler Reservoir	Hyrum Addition	Urban Conservation
BRMBR	Weighted Monthly Bird Use (%)	Maximize	88.3%	91.7%	91.8%	88.8%
	Reliability (%)	Maximize	84.3%	88.2%	89.0%	84.8%
	Resilience (%)	Maximize	29.9%	34.5%	33.3%	30.7%
	Vulnerability (ac-ft/failure)	Minimize	25326	24502	25743	24846
BRCC	Reliability (%)	Maximize	85.0%	90.0%	85.0%	85.0%
	Resilience (%)	Maximize	100.0%	100.0%	100.0%	100.0%
	Vulnerability (ac-ft/failure)	Minimize	9871	8710	10039	9610
PacifiCorp	Hydropower Generation (MWh)	Maximize	183953	188902	183293	184396
	Unmet Demand (sum of monthly average, ac-ft)	Minimize	51897	37650	38304	49718
Logan City	Reliability (%)	Maximize	82.7%	87.2%	82.7%	82.7%
	Resilience (%)	Maximize	22.4%	25.4%	22.4%	22.4%
	Vulnerability (ac-ft/failure)	Minimize	1394	1392	1413	1380

Best	Better	Worse	No Change

Table 5. Water Rights of the BRMBR

Primary Right Holder	Water Right number	Source	Allocated Flow	Point of Diversion
Paul W. and Mary V. Nelson J.T.	29-3172	Stauffer-Packer Spring	1.04 cfs	SURFACE
John Robert Reese Trustee	29-951	Perry Spring Stream	1.0 cfs	SURFACE
USA Fish &Wildlife Services	29-1919	Unnamed Stream	2.4 cfs	SURFACE
USA Fish and Wildlife Services	29-973	Unnamed Stream	2.4 cfs	SURFACE
Grace G. White Trust and LeRoy Clark White Family Trust	29-936	Dan Walker Spring	3.06 cfs	SURFACE
Grace G. White Trust and LeRoy Clark White Family Trust	29-937	Perry Spring Stream	0.56 cfs	SURFACE
USA Fish & Wildlife Service	29-3061	Underground Water Drain (open)	0.002 cfs	POINT TO POINT
USA Fish and Wildlife Service	29-2622	Unnamed Spring Stream	0.015 cfs	POINT TO POINT
USA Fish and Wildlife Service	29-1697	Unnamed Spring Stream	1.0 cfs	SURFACE
Grace G. White Trust and LeRoy Clark White Family Trust	29-3060	Unnamed Spring	1.0 cfs	SURFACE
USA Fish and Wildlife Service	29-1915	Underground Water Drain	1.5 cfs	UNDERGROUND
USA Fish and Wildlife	29-1916	Underground Water Drain	2.0 cfs	UNDERGROUND
USA Fish and Wildlife Service	29-1914	Underground Water Drain	3.0 cfs	UNDERGROUND
USA Fish & Wildlife Services	29-1450	East Slough	7.37 cfs	SURFACE
USA Fish & Wildlife Service	29-3484	Black Slough	45.0 cfs	SURFACE
USA Fish and Wildlife Service	29-768	Underground Water Drain	1.59 cfs	UNDERGROUND
USA Fish and Wildlife Service	29-769	Underground Water Drain	1.114 cfs	UNDERGROUND
USA Fish & Wildlife Service	**29-3485**	**Bear River**	**15.9 cfs**	**SURFACE**
USA Fish & Wildlife Service	**29-3698**	**Bear River**	**2000.0 acre-feet**	**SURFACE**
USA Fish & Wildlife Service	29-3157	Unnamed Stream	0.002 cfs	SURFACE
USA Fish & Wildlife Service	29-770	Underground Water Well	0.01 cfs	UNDERGROUND
USA Fish & Wildlife Service	29-980	Surface Drains	0.5 cfs	SURFACE
USA Fish & Wildlife Service	**29-1014**	**Bear River**	**1000.0 cfs**	**SURFACE**
USA Fish & Wildlife Service	29-1165	Underground Water Well	0.011 cfs	UNDERGROUND
USA Fish & Wildlife Service	29-1330	Underground Water Well	0.134 cfs	UNDERGROUND
USA Fish and Wildlife Service	29-3668	Salt Creek	2468.1267 acre-feet	SURFACE
USA Fish & Wildlife Service	29-3825	Stauffer-Packer Spring	1.04 cfs OR 4.0 acre-feet	SURFACE

USA Fish & Wildlife Service	29-3824	Underground Water Drain	1.0 cfs OR 40.0 acre-feet	SURFACE
USA Fish and Wildlife Service	29-1637	Surface Water	132.88 acre-feet	SURFACE

Note: Data gathered from the Utah Division of Water Rights (2009) online database. Water right numbers for the BRMBR were obtained from Downard, 2010. Water right listed where USA Fish USA Fish & Wildlife Service are not primary water right holders indicate shared water right use with USA Fish & Wildlife Service being a secondary or tertiary water user on that right.

Table 6. Water Needs of the BRMBR and Historical Bear River Discharges

Month	Water Right Number			Total Allocation (ac-ft)
	29-3485	29-3698	29-1014	
Jan			5938	5938
Feb			8202	8202
Mar			61380	61380
Apr			59400	59400
May	976	750	60077	61803
Jun	472	250	35120	35842
Jul			56978	56978
Aug			40868	40868
Sep	472	200	59400	60072
Oct	976	400	27424	28800
Nov	944	400	8987	10331
Dec			1997	1997

Note: Data gathered from the Utah Division of Water Rights (2009) online database. Water right numbers for the BRMBR were obtained from Downard, 2010.

Table 7. Bear River Basin Demand Site Priorities

Priority	Service Area No.	Name	Use Type	Demand Quantified
Included in WEAP Model				
2	1	Bear River Canal Company	Irrigation	Yes
3	2	Bird Refuge	Environmental	Yes
4	8	South Cache Existing	Irrigation	Yes
4	9	South Cache New	Municipal	No
8	3	Cache Valley New	Municipal	No
5	4	Cache Valley Irrigation	Irrigation	No
6	6	New Box Elder County	Irrigation	No
7	7	Box Elder County	Municipal	No
21	5	Wasatch Front	Municipal	No
20	11	Weber Basin	Municipal	Yes
Excluded from WEAP Model				
NA	10	Idaho	Irrigation	No