Section 6 - Conservation and Efficiency

General

This section evaluates water delivery efficiencies and the effect of senior water rights on efficiency improvements, and provides data for a comparative analysis of the cost to benefit of storage compared to conservation and efficiency improvements. The information provide in this section was provided by the Wasco County Soil and Water Conservation District (District).

Irrigation Conservation Opportunities

This assessment was completed by the District in conjunction with this Study. A total of 168 water rights were evaluated, covering 61 different landowners. For this assessment, only surface water rights in the Fifteenmile Creek watershed were evaluated.

All water rights leased in stream were not considered for any system upgrades. If leases are discontinued in the future, additional opportunities may become available. Fish passage concerns are not noted in this assessment, but do exist.

Some application systems are in the process of being upgraded and were not considered as opportunities. Some water rights with less than 3 acres and junior rights were not considered significant for the objectives of this assessment.

The Natural Resources Conservation Service Environmental Quality Incentives Program, Soil and Water Conservation District Cost Share, Oregon Watershed Enhancement Board grants, local electrical cooperative rebates, and, ultimately, landowner stewardship have led to an impressive amount of irrigation upgrades throughout the watershed. Remaining conservation opportunities total 12 individual landowners, covering 1,153 acres as listed on Figure 6-1. Actual meter data were used to estimate saving potential on seven of these landowners. The five sites that did not have meter data were estimated using landowner interviews, site visits, and profession knowledge of the systems.

The assessment identifies the most efficient system upgrade practical to the site; the costs per acre range from $106 to $1,576, with an average of $437 per acre. Costs per acre-foot of water saved were also identified and ranged from $581 to $8,648. The average cost per acre-foot of conserved water is estimated to be $5,410. The estimated cost to implement all identified conservation practices totals $416,899, saving a total of 77.06 acre-feet of water annually.

Two conveyance efficiency projects were identified: Orchard Ridge Ditch and Little Ditch. These are the only two open ditch diversion systems identified as conservation opportunities in the watershed. One other open ditch diversion is present but diverts water only a short distance away from the creek and immediately returns. The Little Ditch is identified as losing 12.29 acre-feet annually. Most of this amount likely returns directly to Fifteenmile Creek, as the ditch is only 6,000 feet long. The ditch serves two users. The end user is in the process of converting to a direct stream diversion and a pressurized on-demand system. Since funded and in progress, this was not identified as an opportunity. The remaining user is one-third of the way down the ditch and is interested in converting to a direct stream diversion if funding is available.

Orchard Ridge Ditch is by far the largest conservation opportunity and is estimated to lose 227 acre-feet annually. The estimated cost to pipe the ditch is roughly $1.5 million. This puts the cost per acre-foot of water saved annually at $6,600.

Summary

The landowners in the Fifteenmile Creek Basin have been proactive in their efforts to make irrigation in the valley more efficient. The Orchard Ridge Ditch pipeline is a major part of this Study and is the major conservation project left to accomplish, but will not provide the volume of water that the storage project can. In this section, the cost estimate for the pipeline is considerably less than the cost estimate for the pipeline shown in Section 8 of this Study. The pipe in this section is sized to deliver current irrigation water right flow, while the pipe in Section 8 is sized much larger in order to provide enough flow capacity to fill a reservoir.

Priority	Use/ Acres	Rate	Name	Page	Average Acre-Feet	Average Acre-Feet per Acre	Conveyance Efficiency	Conveyance Loss (Acre-Feet)	Acre-feet Available for Delivery	Application Type	Application Condition	Application Efficiency	Potential Efficiency	Potential Saving (Acre-Feet)	Savings (Acre-Feet per Acre)	Potential Practices	Cost of Application Upgrade	App. Upgrade Cost per Acre-Feet		Diversion Type	Diversion Condition	Crop
December 31, 1897	20.53	0.26	Rogers	66	10.12	0.49	100%	0.00	10.12	Big Gun	Poor	50	74	3.28	0.16	Pipe, Kline/Handline	$ 18,477	$ 5,629	$ 900	DSCS	Fair	Grass
May 6, 1916	8.72	0.11	Rogers	66	4.30	0.49	100%	0.00	4.30	Big Gun	Poor	50	74	1.39	0.16	Pipe, Kline/Handline	$ 7,848	$ 5,629	$ 900	DSCS	Fair	Grass
December 31, 1858	28.90	0.36	Bolton	31	43.35	1.50	100%	0.00	43.35	HLWL	Poor	65	74	5.27	0.18	Sprinkler Upgrade	$ 3,063	$ 581	$ 106	DSCS	Good	Alfalfa
December 27, 1966	14.20	0.18	Bolton	31	21.30	1.50	100%	0.00	21.30	HLWL	Poor	65	74	2.59	0.18	Sprinkler Upgrade	$ 1,505	$ 581	$ 106	DSCS	Good	Alfalfa
December 31, 1858	15.00	0.19	Ferres	22	2.80	0.19	100%	0.00	2.80	HLWL	Poor	65	74	0.34	0.02	Sprinkler Upgrade	$ 1,590	$ 4,663	$ 106	DSCS	Fair	Grass
December 31, 1875	16.40	0.21	Ferres	22	3.07	0.19	100%	0.00	3.07	HLWL	Poor	65	74	0.37	0.02	Sprinkler Upgrade	$ 1,738	$ 4,663	$ 106	DSCS	Fair	Grass
February 28, 1964	37.00	0.46	Ferres	22	6.92	0.19	100%	0.00	6.92	HLWL	Poor	65	74	0.84	0.02	Sprinkler Upgrade	$ 3,922	$ 4,663	$ 106	DSCS	Fair	Grass
October 27, 1909	12.00	0.15	Hanna, Jim	49	9.34	0.78	100%	0.00	9.34	HLWL	Fair	70	74	0.50	0.04	Sprinkler Upgrade	$ 1,272	$ 2,520	$ 106	DSCS	Good	Alfalfa
August 3, 1912	26.60	0.33	Hanna, Jim	49	20.70	0.78	100%	0.00	20.70	HLWL	Fair	70	74	1.12	0.04	Sprinkler Upgrade	$ 2,820	$ 2,520	$ 106	DSCS	Good	Alfalfa
December 31, 1877	11.70	0.15	Johnson (little Ditch)	55	35.10	3.00	65%	12.29	22.82	HLWL	Fair	65	74	2.77	0.24	HLWL	$ 10,530	$ 3,795	$ 900	Ditch	Poor	Mixed
January 30, 1926	9.00	0.1	Johnson	18	6.30	0.70	100%	0.00	6.30	HLWL	Fair	70	74	0.34	0.04	Sprinkler Upgrade	$ 954	$ 2,801	$ 106	Ditch	Fair	Alfalfa
April 13, 1966	16.00	0.2	Johnson	18	11.20	0.70	100%	0.00	11.20	HLWL	Fair	70	74	0.61	0.04	Sprinkler Upgrade	$ 1,696	$ 2,801	$ 106	Ditch	Fair	Alfalfa
October 27, 1909	437.00	5.46	Lyda (Orchard Ridge Ditch)	60	275.95	0.63	50%	137.97	137.97	HLWL	Fair	70	90	30.66	0.07	Pivot	$ 230,000	$ 7,501	$ 526	Dam/ Diversion	Good	Alfalfa
September 5, 1922	16.00	0.2	Lyda (Orchard Ridge Ditch)	60	10.10	0.63	50%	5.05	5.05	HLWL	Fair	70	74	0.27	0.02	Sprinkler Upgrade	$ 1,696	$ 6,211	$ 106	Dam/ Diversion	Good	Alfalfa
April 25, 1928	55.00	0.69	Lyda (Orchard Ridge Ditch)	60	34.73	0.63	50%	17.37	17.37	HLWL	Fair	70	74	0.94	0.02	Sprinkler Upgrade	$ 5,830	$ 6,211	$ 106	Dam/ Diversion	Good	Alfalfa
March 28, 1930	131.00	1.64	Lyda (Orchard Ridge Ditch)	60	82.72	0.63	50%	41.36	41.36	HLWL	Fair	70	74	2.24	0.02	Sprinkler Upgrade	$ 13,886	$ 6,211	$ 106	Dam/ Diversion	Good	Alfalfa
July 27, 1923	3.00	0.04	Markman, Jim	21	1.63	0.54	100%	0.00	1.63	HLWL	Fair	70	74	0.09	0.03	Sprinkler Upgrade	$ 318	$ 3,609	$ 106	DSCS	Good	Alfalfa
April 24, 1929	30.00	0.38	Markman, Jim	21	0.00	0.00	100%	0.00	0.00	HLWL	Fair	70	74	0.00	0.00	Sprinkler Upgrade	$ 3,180	NA	$ 106	DSCS	Good	Alfalfa
April 14, 1960	53.00	0.54	Markman, Jim	21	30.94	0.58	100%	0.00	30.94	HLWL	Fair	70	74	1.67	0.03	Sprinkler Upgrade	$ 5,618	$ 3,360	$ 106	DSCS	Good	Alfalfa
June 8, 1976	13.30	0.17	Markman, Jim	21	0.00	0.00	100%	0.00	0.00	HLWL	Fair	70	74	0.00	0.00	Sprinkler Upgrade	$ 1,410	NA	$ 106	DSCS	Good	Alfalfa
December 31, 1869	18.50	0.23	Phil Kaser (McLaughlin)	16	8.12	0.44	100%	0.00	8.12	HLWL	Fair	70	74	0.44	0.02	Sprinkler Upgrade	$ 1,961	$ 4,469	$ 106	DSCS	Fair	Alfalfa
December 31, 1907	10.60	0.13	Phil Kaser (McLaughlin)	16	4.65	0.44	100%	0.00	4.65	HLWL	Fair	70	74	0.25	0.02	Sprinkler Upgrade	$ 1,124	$ 4,469	$ 106	DSCS	Fair	Alfalfa
August 22, 1921	10.00	0.13	Tenold	8	20.00	2.00	100%	0.00	20.00	SS Impact	Fair	70	94	5.11	0.51	Micro/Drip	$ 15,000	$ 2,938	$ 1,500	Dam/ Diversion	Poor	Cherries
December 26, 1930	1.00	0.0125	Tenold	8	2.00	2.00	100%	0.00	2.00	SS Impact	Fair	70	94	0.51	0.51	Micro/Drip	$ 1,500	$ 2,938	$ 1,500	Dam/ Diversion	Poor	Cherries
January 10, 1944	8.50	0.11	Tenold	8	17.00	2.00	100%	0.00	17.00	SS Impact	Fair	70	94	4.34	0.51	Micro/Drip	$ 12,750	$ 2,938	$ 1,500	Dam/ Diversion	Poor	Cherries
October 27, 1909	68.00	0.85	Thomas, Joan (Orchard Ridge Ditch)	59	51.00	0.75	50%	25.50	25.50	HLWL	Fair	65	74	3.10	0.05	Sprinkler Upgrade	$ 7,208	$ 2,324	$ 106	Ditch	Fair	Alfalfa
March 4, 1861	22.00	0.28	Underhill, Gene (Airport)	45	14.13	0.64	100%	0.00	14.13	HLWL	Fair	70	74	0.76	0.03	Sprinkler Upgrade	$ 2,332	$ 3,052	$ 106	DSCS	Good	Alfalfa
May 7, 1957	25.20	0.32	Underhill, Gene (Airport)	45	16.19	0.64	100%	0.00	16.19	HLWL	Fair	70	74	0.88	0.03	Sprinkler Upgrade	$ 2,671	$ 3,052	$ 106	DSCS	Good	Alfalfa
December 31, 1856	10.50	0.13	Underhill, Gene (Home)	42	10.76	1.03	100%	0.00	10.76	HLWL	Good	74	90	1.91	0.18	Pivot	$ 16,547	$ 8,648	$ 1,576	MIXED	Fair	Alfalfa
December 31, 1885	24.40	0.31	Underhill, Gene (Home)	42	25.01	1.03	100%	0.00	25.01	HLWL	Good	74	90	4.45	0.18	Pivot	$ 38,453	$ 8,648	$ 1,576	MIXED	Fair	Alfalfa
	1153.05							239.54						77.06		Total	$ 416,899					
							Little Ditch	12.29	$ 14,500.00	$ 1,179.82	per AF					Average per Acre-Feet	$ 5,410					
							Lyda Ditch	227.25	$ 1,500,000.00	$ 6,600.81	per AF											

DSCS = Direct Self-Cleaning Screen
HLWL = Wheel Line
SS Impact = Solid Set Impact Sprinklers

Yellow highlight = Lyda Ditch
Gray highlight = Little Ditch

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WASCO COUNTY SOIL AND WATER CONSERVATION DISTRICT
FIFTEENMILE CREEK WATERSHED ABOVEGROUND STORAGE FEASIBILITY STUDY
CONSERVATION AND EFFICIENCY CHART

FIGURE 6-1