



# Total Maximum Daily Loads for the Willamette Subbasins

## Technical Support Document Appendix F: Lower Willamette Shade Results

Amended, May 2025



This document was prepared by

Becky Talbot, Erin Costello, Ryan Michie

Oregon Department of Environmental  
Quality Program Name

700 NE Multnomah Street, Suite 600

Portland Oregon, 97232

Contact: Steve Mrazik

Phone: 503-229-5983 x267

[www.oregon.gov/deq](http://www.oregon.gov/deq)



State of Oregon  
Department of Environmental Quality

**Translation or other formats**

[Español](#) | [한국어](#) | [繁體中文](#) | [Русский](#) | [Tiếng Việt](#) | [العربية](#)

800-452-4011 | TTY: 711 | [deqinfo@deq.oregon.gov](mailto:deqinfo@deq.oregon.gov)

**Non-discrimination statement**

DEQ does not discriminate on the basis of race, color, national origin, disability, age or sex in administration of its programs or activities. Visit DEQ's [Civil Rights and Environmental Justice page](#).

# List of tables

Table 1: Summary of shade results for the Lower Willamette Subbasins study area. .... 4

Table 2: Shade results stratified by designated management agency and model scenario within the Lower Willamette Subbasins study area. .... 4

Table 3: Shade results stratified by streams within the Lower Willamette Subbasins study area. .... 4

Table 4: Shade results stratified by DEQ assessment unit ID in the Lower Willamette Subbasins study area. .... 12

Table 5: Shade results stratified by HUC10 watershed in the Lower Willamette Subbasins study area. ... 13

Table 6: Shade results stratified by HUC12 subwatershed in the Lower Willamette Subbasins study area. .... 13

Table 7: Shade results for the Oregon Department of Agriculture at the HUC10 watershed level in the Lower Willamette Subbasins study area. .... 14

Table 8: Shade results for the Oregon Department of Agriculture at the HUC12 subwatershed level in the Lower Willamette Subbasins study area. .... 14

Table 9: Shade results for the Oregon Department of Agriculture’s water quality management areas at the HUC10 watershed level in the Lower Willamette Subbasins study area. .... 15

Table 10: Shade results for the Oregon Department of Agriculture’s water quality management areas at the HUC12 subwatershed level in the Lower Willamette Subbasins study area. .... 15

# Overview

To summarize the status of effective shade in the Lower Willamette study area, the results of HeatSource shade models for different management scenarios, streams and designated management agencies were compared. The tables below show the effective shade results for the study area in multiple ways. The mean shade for current condition and restored vegetation scenarios is presented, as well as the shade gap between scenarios. In some tables, the shade gap is summarized by the number of stream kilometers that fall within shade gap categories of 0-15 percentage points, 16-25 percentage points, 26-50 percentage points, and 51-100 percentage points.

Table 1 shows effective shade results for the entire Lower Willamette study area. Table 2 shows shade results stratified by designated management agency. Table 3 shows shade results stratified by designated management agency and stream. Table 4 shows shade results stratified by DEQ assessment unit ID. Table 5 and Table 6 present shade results at the HUC10 and HUC12 levels, respectively. Table 7 and Table 8 show shade results for the Oregon Department of Agriculture (ODA) at the HUC10 and HUC12 levels, respectively. Shade results for ODA’s agricultural water quality management areas are presented at the HUC10 and HUC12 levels in Table 9 and Table 10, respectively.

**Table 1: Summary of shade results for the Lower Willamette Subbasins study area.**

Extent	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
Study Area	64	77	13	201.5	141.5	22.2	26	11.8

**Table 2: Shade results stratified by designated management agency and model scenario within the Lower Willamette Subbasins study area.**

Designated Management Agency	Current Condition	Restored Vegetation	Protected Vegetation	System Potential in Management Areas	Topography
BNSF	35	42	35	42	3
City of Fairview	21	54	4	23	4
City of Gresham	63	81	63	81	6
City of Happy Valley	79	90	77	86	7
City of Lake Oswego	83	90	81	88	12
City of Milwaukie	62	80	61	75	6
City of Portland	61	73	59	70	9
Clackamas County	66	86	66	84	6
Multnomah County	75	90	73	88	9
Oregon Department of Agriculture	65	85	64	85	5
Oregon Department of Forestry - Private	89	92	89	92	15
Oregon Parks and Recreation Department	91	91	91	91	14
Port of Portland	29	45	29	45	3
Portland & Western Railroad	82	89	11	83	11
Road	54	77	46	68	8
Union Pacific Railroad	34	62	34	56	3
Water	47	85	33	75	17

**Table 3: Shade results stratified by streams within the Lower Willamette Subbasins study area.**

Designated Management Agency	Stream Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
City of Portland	Arnold Creek	90	92	2	3.3	3.3	0.0	0.0	0.0
City of Portland	Badger Creek	51	87	36	0.1	0.0	0.0	0.0	0.0

Designated Management Agency	Stream Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
Clackamas County	Badger Creek	76	89	13	3.3	2.3	0.3	0.5	0.1
Oregon Department of Agriculture	Badger Creek	81	88	7	0.6	0.6	0.0	0.0	0.0
City of Portland	Balch Canyon	66	84	18	4.1	2.6	0.2	0.8	0.4
Multnomah County	Balch Canyon	86	90	4	0.3	0.3	0.0	0.0	0.0
Oregon Department of Forestry - Private	Balch Canyon	90	92	2	2.4	2.3	0.0	0.0	0.0
Road	Balch Canyon	34	58	24	0.0	0.0	0.0	0.0	0.0
City of Gresham	Butler Creek	78	86	8	2.7	2.4	0.1	0.1	0.1
City of Portland	Clatsop Creek	86	90	4	1.3	1.3	0.0	0.0	0.0
Multnomah County	Clatsop Creek	88	92	4	1.0	1.0	0.0	0.0	0.0
BNSF	Columbia Slough (Lower)	35	42	7	0.1	0.1	0.0	0.0	0.0
City of Portland	Columbia Slough (Lower)	15	24	9	18.4	15.0	2.4	0.9	0.1
Port of Portland	Columbia Slough (Lower)	23	38	15	1.6	1.0	0.6	0.0	0.0
Road	Columbia Slough (Lower)	50	55	5	0.0	0.0	0.0	0.0	0.0
Union Pacific Railroad	Columbia Slough (Lower)	48	51	3	0.0	0.0	0.0	0.0	0.0
City of Fairview	Columbia Slough (Upper)	21	54	33	0.1	0.0	0.0	0.0	0.0

Designated Management Agency	Stream Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
City of Gresham	Columbia Slough (Upper)	14	38	24	1.5	0.6	0.2	0.4	0.2
City of Portland	Columbia Slough (Upper)	40	61	21	28.3	12.6	5.7	8.2	1.8
Port of Portland	Columbia Slough (Upper)	50	73	23	0.4	0.1	0.1	0.2	0.0
Road	Columbia Slough (Upper)	49	71	22	0.5	0.2	0.0	0.2	0.0
Union Pacific Railroad	Columbia Slough (Upper)	7	85	78	0.0	0.0	0.0	0.0	0.0
City of Portland	Crestline Creek	87	91	4	0.3	0.3	0.0	0.0	0.0
City of Portland	Crystal Springs Creek	52	71	19	3.8	1.9	0.6	1.0	0.3
Road	Crystal Springs Creek	18	77	59	0.1	0.0	0.0	0.0	0.1
City of Happy Valley	Deardorff Creek	76	88	12	0.1	0.1	0.0	0.0	0.0
City of Portland	Deardorff Creek	86	90	4	1.4	1.3	0.0	0.0	0.0
Clackamas County	Deardorff Creek	82	89	7	0.1	0.1	0.0	0.0	0.0
City of Portland	Doane Creek	77	90	13	3.9	3.1	0.1	0.1	0.6
City of Portland	Doane Creek Tributary 1	91	92	1	0.9	0.9	0.0	0.0	0.0
City of Portland	Doane Creek Tributary 2	93	94	1	1.6	1.6	0.0	0.0	0.0
City of Portland	Doane Creek Tributary 3	92	94	2	1.4	1.4	0.0	0.0	0.0

Designated Management Agency	Stream Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
Multnomah County	Dunthorpe Stream	80	91	11	1.1	0.8	0.1	0.1	0.0
Road	Dunthorpe Stream	28	87	59	0.0	0.0	0.0	0.0	0.0
Water	Dunthorpe Stream	82	85	3	0.0	0.0	0.0	0.0	0.0
Multnomah County	Dunthorpe Stream Tributary	77	92	15	0.5	0.3	0.1	0.1	0.0
City of Portland	Errol Creek	50	83	33	0.6	0.2	0.1	0.2	0.1
City of Portland	Falling Creek	68	86	18	2.3	1.6	0.2	0.1	0.4
Road	Falling Creek	88	88	0	0.1	0.1	0.0	0.0	0.0
City of Portland	Frog Creek	79	88	9	1.5	1.2	0.0	0.2	0.0
City of Portland	Indian Creek	81	88	7	1.5	1.3	0.1	0.0	0.0
Road	Indian Creek	62	71	9	0.0	0.0	0.0	0.0	0.0
City of Gresham	Jenne Creek	62	88	26	0.7	0.3	0.0	0.1	0.2
City of Portland	Jenne Creek	76	88	12	0.5	0.3	0.1	0.0	0.0
Multnomah County	Jenne Creek	79	90	11	0.8	0.6	0.1	0.1	0.0
City of Gresham	Johnson Creek	66	85	19	9.6	4.8	2.0	2.3	0.5
City of Milwaukie	Johnson Creek	62	80	18	2.9	1.5	0.6	0.8	0.0
City of Portland	Johnson Creek	67	83	16	13.3	8.2	2.3	2.3	0.5
Clackamas County	Johnson Creek	58	83	25	5.1	2.6	0.6	0.8	1.1
Multnomah County	Johnson Creek	64	84	20	1.0	0.6	0.1	0.3	0.0
Oregon Department of Agriculture	Johnson Creek	68	85	17	9.3	5.9	1.2	1.4	0.7
Road	Johnson Creek	56	78	22	1.2	0.5	0.2	0.4	0.1
City of Gresham	Kelley Creek	69	89	20	1.6	0.9	0.2	0.3	0.2

Designated Management Agency	Stream Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
City of Portland	Kelley Creek	79	88	9	0.7	0.5	0.0	0.1	0.0
Multnomah County	Kelley Creek	72	89	17	2.7	1.7	0.4	0.4	0.2
Oregon Department of Agriculture	Kelley Creek	77	89	12	0.1	0.1	0.0	0.0	0.0
Oregon Department of Forestry - Private	Kelley Creek	87	91	4	2.0	1.9	0.1	0.0	0.0
City of Portland	Linnton Creek	22	77	55	0.3	0.0	0.0	0.1	0.2
City of Portland	Linnton Creek NF	92	95	3	0.9	0.9	0.0	0.0	0.0
City of Portland	Linnton Creek SF	94	96	2	1.9	1.9	0.0	0.0	0.0
City of Portland	Miller Creek	91	94	3	1.0	1.0	0.0	0.0	0.0
Multnomah County	Miller Creek	79	87	8	0.2	0.1	0.0	0.0	0.0
Oregon Department of Agriculture	Miller Creek	62	86	24	0.1	0.0	0.0	0.0	0.0
Oregon Department of Forestry - Private	Miller Creek	92	94	2	1.7	1.7	0.0	0.0	0.0
Portland & Western Railroad	Miller Creek	82	89	7	0.0	0.0	0.0	0.0	0.0
Road	Miller Creek	78	92	14	0.1	0.1	0.0	0.0	0.0
Water	Miller Creek	47	82	35	0.0	0.0	0.0	0.0	0.0
City of Portland	Miller Creek Tributary	94	95	1	1.5	1.5	0.0	0.0	0.0
Oregon Department of Forestry - Private	Miller Creek Tributary	89	91	2	0.0	0.0	0.0	0.0	0.0
City of Happy Valley	Mitchell Creek	79	90	11	0.7	0.5	0.0	0.1	0.0

Designated Management Agency	Stream Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
City of Portland	Mitchell Creek	89	91	2	0.7	0.7	0.0	0.0	0.0
Clackamas County	Mitchell Creek	89	93	4	0.4	0.4	0.0	0.0	0.0
Multnomah County	Mitchell Creek	61	89	28	1.3	0.6	0.2	0.2	0.3
City of Portland	Munger Creek	93	95	2	1.4	1.3	0.0	0.0	0.0
City of Portland	Munger Creek Tributary	94	95	1	0.6	0.6	0.0	0.0	0.0
City of Lake Oswego	Nettle Creek	82	90	8	2.2	2.0	0.1	0.1	0.1
Clackamas County	Nettle Creek	78	92	14	0.3	0.2	0.0	0.0	0.0
Road	Nettle Creek	26	84	58	0.0	0.0	0.0	0.0	0.0
City of Portland	Newton Creek	83	93	10	2.4	2.1	0.0	0.1	0.2
Road	Newton Creek	71	78	7	0.0	0.0	0.0	0.0	0.0
City of Lake Oswego	Park Creek	88	91	3	0.1	0.1	0.0	0.0	0.0
City of Portland	Park Creek	88	90	2	1.1	1.1	0.0	0.0	0.0
City of Portland	River View Stream 2	84	88	4	1.0	0.9	0.0	0.0	0.0
City of Portland	River View Stream 6	89	90	1	1.0	1.0	0.0	0.0	0.0
City of Portland	River View Stream 7	86	89	3	0.3	0.2	0.0	0.0	0.0
Multnomah County	River View Stream 7	86	92	6	0.5	0.4	0.0	0.0	0.0
City of Portland	Rockin Chair Creek NF	95	96	1	0.7	0.7	0.0	0.0	0.0
City of Portland	Rocking Chair Creek	92	94	2	1.8	1.8	0.0	0.0	0.0

Designated Management Agency	Stream Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
Oregon Department of Forestry - Private	Rocking Chair Creek	90	91	1	0.3	0.3	0.0	0.0	0.0
City of Portland	Saltzman Creek	74	91	17	2.7	1.9	0.1	0.2	0.4
Road	Saltzman Creek	21	57	36	0.0	0.0	0.0	0.0	0.0
City of Portland	Stephens Creek	73	86	13	2.9	2.2	0.2	0.2	0.3
Road	Stephens Creek	69	78	9	0.4	0.3	0.0	0.1	0.0
City of Portland	Stephens Creek I5 Tributary	85	88	3	0.1	0.1	0.0	0.0	0.0
City of Portland	Stephens Creek Tributary 1	86	90	4	1.0	1.0	0.0	0.0	0.0
Clackamas County	Sunshine Creek	65	88	23	3.1	1.6	0.4	0.6	0.5
Oregon Department of Agriculture	Sunshine Creek	53	86	33	3.5	1.6	0.2	0.4	1.1
Oregon Department of Forestry - Private	Sunshine Creek	83	90	7	0.1	0.1	0.0	0.0	0.0
City of Lake Oswego	Tryon Creek	81	90	9	2.5	2.0	0.4	0.1	0.0
City of Portland	Tryon Creek	80	88	8	5.4	4.5	0.4	0.5	0.0
Clackamas County	Tryon Creek	91	93	2	0.0	0.0	0.0	0.0	0.0
Road	Tryon Creek	46	77	31	0.3	0.1	0.1	0.0	0.1
Water	Tryon Creek	13	87	74	0.0	0.0	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 1	74	84	10	0.4	0.3	0.0	0.0	0.0

Designated Management Agency	Stream Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
City of Portland	Tryon Creek Tributary 2	89	91	2	0.9	0.9	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 3	87	91	4	1.1	1.1	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 4	87	91	4	0.7	0.6	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 5	89	91	2	1.0	1.0	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 5 Tributary A	91	92	1	0.3	0.3	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 6	87	90	3	0.5	0.4	0.0	0.0	0.0
City of Lake Oswego	Tryon Creek Tributary 7	89	90	1	0.9	0.9	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 7	77	87	10	0.0	0.0	0.0	0.0	0.0
Clackamas County	Tryon Creek Tributary 7	91	93	2	0.0	0.0	0.0	0.0	0.0
Oregon Parks and Recreation Department	Tryon Creek Tributary 7	91	91	0	0.1	0.1	0.0	0.0	0.0
City of Lake Oswego	Tryon Creek Tributary 8	86	88	2	0.0	0.0	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 8	86	91	5	0.5	0.5	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 8 Tributary A	89	92	3	0.4	0.4	0.0	0.0	0.0
City of Portland	Tryon Creek Tributary 8 Tributary B	87	92	5	0.3	0.3	0.0	0.0	0.0
City of Portland	Veterans Creek	88	91	3	0.9	0.8	0.0	0.0	0.0

Designated Management Agency	Stream Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
Clackamas County	Veterans Creek	59	81	22	0.8	0.5	0.0	0.0	0.2
Multnomah County	Veterans Creek	93	94	1	0.4	0.4	0.0	0.0	0.0
Road	Veterans Creek	28	78	50	0.1	0.0	0.0	0.0	0.0
City of Portland	Wahoo Creek	91	93	2	1.0	1.0	0.0	0.0	0.0
City of Portland	Wahoo Creek Tributary	88	92	4	1.8	1.8	0.0	0.0	0.0
Clackamas County	Wahoo Creek Tributary	90	92	2	0.1	0.1	0.0	0.0	0.0

**Table 4: Shade results stratified by DEQ assessment unit ID in the Lower Willamette Subbasins study area.**

AU_ID	AU_Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
OR_LK_1709001202_02_100857	Buffalo Slough	13	24	11	1.5	1.1	0.2	0.2	0.0
OR_SR_1709001201_02_104170	Johnson Creek	65	83	18	31.8	17.4	5.8	7.1	1.6
OR_SR_1709001201_02_104172	Tryon Creek	81	90	9	2.8	2.3	0.3	0.1	0.0
OR_SR_1709001202_02_104173	Saltzman Creek	50	84	34	1.2	0.4	0.1	0.2	0.4
OR_WS_170900120101_02_104550	HUC12 Name: Upper Johnson Creek	71	88	17	38.4	26.3	3.5	4.5	4.1
OR_WS_170900120103_02_104552	HUC12 Name: Lower Johnson Creek	73	84	11	14.1	10.7	0.9	1.6	0.8
OR_WS_170900120104_02_104553	HUC12 Name: Oswego Creek-Willamette River	83	89	6	22.0	19.4	1.2	0.8	0.7
OR_WS_170900120201_02_104554.1	HUC12 Name: Columbia Slough (Lower)	16	26	10	20.2	16.2	3.0	0.9	0.1
OR_WS_170900120201_02_104554.2	HUC12 Name: Columbia Slough (Upper)	40	62	22	29.3	12.4	5.9	8.8	2.1

AU_ID	AU_Name	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
OR_WS_170900120202_02_104555	HUC12 Name: Balch Creek-Willamette River	83	91	8	35.5	30.8	1.1	1.7	1.9
OR_WS_170900120305_02_104561	HUC12 Name: Multnomah Channel	91	94	3	4.7	4.5	0.1	0.0	0.0

**Table 5: Shade results stratified by HUC10 watershed in the Lower Willamette Subbasins study area.**

Watershed	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
1709001201: Johnson Creek-Willamette River	72	86	14	109.1	76.0	11.8	14.1	7.3
1709001202: Columbia Slough-Willamette River	52	65	13	87.7	60.9	10.3	11.9	4.5
1709001203: Multnomah Channel	91	94	3	4.7	4.5	0.1	0.0	0.0

**Table 6: Shade results stratified by HUC12 subwatershed in the Lower Willamette Subbasins study area.**

Subwatershed	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
170900120101: Upper Johnson Creek	69	87	18	51.6	32.8	6.0	7.7	5.0
170900120103: Lower Johnson Creek	69	83	14	32.7	21.5	4.2	5.4	1.5
170900120104: Oswego Creek-Willamette River	82	89	7	24.9	21.7	1.5	1.0	0.7

Subwatershed	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
170900120201: Columbia Slough	30	47	17	50.9	29.6	9.1	10.0	2.2
170900120202: Balch Creek- Willamette River	82	90	8	36.7	31.3	1.2	1.9	2.3
170900120305: Multnomah Channel	91	94	3	4.7	4.5	0.1	0.0	0.0

**Table 7: Shade results for the Oregon Department of Agriculture at the HUC10 watershed level in the Lower Willamette Subbasins study area.**

Designated Management Agency	Watershed	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
Oregon Department of Agriculture	1709001201: Johnson Creek- Willamette River	65	85	20	13.5	8.2	1.5	1.8	1.9
Oregon Department of Agriculture	1709001203: Multnomah Channel	62	86	24	0.1	0.0	0.0	0.0	0.0

**Table 8: Shade results for the Oregon Department of Agriculture at the HUC12 subwatershed level in the Lower Willamette Subbasins study area.**

Designated Management Agency	Subwatershed	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
Oregon Department of Agriculture	170900120101: Upper Johnson Creek	65	85	20	13.5	8.2	1.5	1.8	1.9
Oregon Department of Agriculture	170900120305: Multnomah Channel	62	86	24	0.1	0.0	0.0	0.0	0.0

**Table 9: Shade results for the Oregon Department of Agriculture’s water quality management areas at the HUC10 watershed level in the Lower Willamette Subbasins study area.**

Designated Management Agency	Agricultural Water Quality Management Area	HUC10	Watershed	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
Oregon Department of Agriculture	Lower Willamette	1709001201	Johnson Creek-Willamette River	65	85	20	13.5	8.2	1.5	1.8	1.9
Oregon Department of Agriculture	Lower Willamette	1709001203	Multnomah Channel	62	86	24	0.1	0.0	0.0	0.0	0.0

**Table 10: Shade results for the Oregon Department of Agriculture’s water quality management areas at the HUC12 subwatershed level in the Lower Willamette Subbasins study area.**

Designated Management Agency	Agricultural Water Quality Management Area	HUC12	Subwatershed	Current Condition	Restored Vegetation	Shade Gap	Total Stream Kilometers Assessed	Stream Kilometers with 0%-15% Shade Gap	Stream Kilometers with 16%-25% Shade Gap	Stream Kilometers with 26%-50% Shade Gap	Stream Kilometers with 51%-100% Shade Gap
Oregon Department of Agriculture	Lower Willamette	170900120101	Upper Johnson Creek	65	85	20	13.5	8.2	1.5	1.8	1.9
Oregon Department of Agriculture	Lower Willamette	170900120305	Multnomah Channel	62	86	24	0.1	0.0	0.0	0.0	0.0