



Reach GL02, GL03, GL04

1998 Aerial Photo Map



300 0 300 600 Feet

Legend

- GL00 - Project Reach
- Reach Divider
- Stream Centerline 2002

Data Sources: Washington County (1998
orthophoto base)
Washington County (2002)
Metro (RLIS Lite 2002)
SWCD (2003)

March 2003



Reach GL02

Existing Conditions

Reach GL02 begins approximately 4600 feet downstream of the confluence with Clear Creek and extends approximately 3100 feet to the confluence with Kelly Creek

Informal Field Survey completed on 12/9/02. Low flow conditions (approximate flow rate at Highway 47 stream gage = 25 cfs)

Channel Habitat Type: LM (Low Gradient, Moderately Confined)

Adjacent Land Use: Agriculture (Annual and Perennial Crops)

Characteristics:

- *Channel Conditions:* The channel appears to be moderately confined, but it appears that flood flows may access low terraces along both the left and right banks during high flows that are greater than the bankfull flow. About 80 percent of the right and left banks have riprap protection. It is understood, through conversations with landowners, that some of the riprap was installed after the 1964 flood and some was installed after the 1996 flood. Near the middle of the reach, there is a farm road that runs right through the creek (no bridge). It's assumed this is only used during low flow periods. The channel location has not changed significantly between 1994 and 2002. The gradient of the stream within the reach is approximately 0.3 percent. The valley slope is approximately 0.5 percent
- *Riparian Conditions:* A majority of the riparian area is in moderate to poor condition with stands that are narrow and fragmented. The width varies from 0 feet to 250 feet. The stream runs west to east for a significant length of the reach. Much of the right bank (south side) has been protected with riprap. Some alders have grown through the riprap, but this is the only row of trees between the adjacent access road and the creek. There is very little effective shading along this approximately 800 foot stretch. There is approximately 500 foot stretch with no riparian vegetation along the left bank. This bank was protected with riprap after the 1996 flood.
- *Water Quality:* Temperature measurements taken at Roderick Road (the closest temp monitoring location to this reach) show that the largest diurnal temperature change, of any of the monitoring station along Gales Creek, occurred at Roderick Road. It appears likely that solar heating and a lack of riparian vegetation cause the high variability in daily temperatures. See Figure 4-1 for a comparison of diurnal temperatures at three monitoring stations along Gales Creek.
- *Water Quantity:* Five permitted water supply diversions exist along the reach. Two diversions were noted during the field visit. The ends of two of the diversion pipes were screened, but it is not known if the screening met ODFW screening criteria. Table 4-3 presents information for the following permitted diversions along the reach. All diversions are for irrigation (IR).

Table 4-3: Reach GL02

Permit Number	Use	Rate	Notes
20255	IR	1.1 cfs	Field verified that this is a screened diversion
24421	IR	0.17 cfs	No field verification of screening
35454	IR	.08 cfs	No field verification of screening
11746	IR	1.24	No field verification of screening
7185	IR	.79	Field verified that this is a screened diversion

- *Habitat Access:* No passage barriers encountered along this reach.
- *Habitat Elements:* No formal habitat survey was completed, however there were observations of beaver activity along the reach. Predominately a gravel and cobble substrate, with bedrock near the upstream end of the reach (approximately 100 feet). The reach is predominately riffle/glide habitat, with 3 - 4 pools that are up to 5 feet deep at the time of the survey. A majority of the pools are within the upstream 300 feet of the reach, where the stream approaches a hillside. The reach is approximately 65 percent glide, 30 percent riffles and 5 percent pools. The glides have gravel/cobble substrate with moderate sediment embeddedness. The riffles have little sediment embeddedness. The bedrock at the upstream portion of the reach is basalt and appears to extend in fingers from the hillside on the right bank. Narrow gravel bars exist. LWD volume is very low.

Degree of Impairment Score = 2.5

Limiting Factors

- Habitat Elements
- Channel Conditions
- Riparian Conditions
- Water Quality

Target Functions

- Floodplain Connection – Enhance existing riparian areas by planting and maintaining additional native trees and shrubs.
- In-stream Complexity – Place wood in the stream to provide in-channel habitat diversity, deep pools, and locations with cooler water temperatures during the warm summer months.
- Riparian Zone - Intensive riparian vegetation planting and maintenance in areas with little or no existing riparian vegetation.

Recommended Actions

1. Work with the landowner to plant riparian vegetation along approximately 500 feet of the left bank where riprap was placed after the 1996 flood. Enhance the approximately 800-foot long riparian zone along the right bank, where riprap was placed after the 1964 flood.



Photo GL02-1

Looking upstream (northeast) on Gales Creek. Riprap bank is void of native shrubs and trees. Planting and maintenance of native riparian trees and shrubs, through the riprap, will improve stream shading along this bank. Planting of coniferous trees along the top of bank will also improve shading and will provide a source of LWD in the future.

2. Work with the landowner to enhance the remaining riparian areas through the planting of additional trees for stream shading.
3. Increase the in-stream complexity of the channel through the placement of LWD. Review with the landowner the potential of removing a short (approximately 50 feet) section of riprap and placing log vanes or some other form of wood debris that would help to form a scour pool. A specific location would be determined after discussions with the landowner and evaluation by a geomorphologist during the project design phase.



Photo GL02-2

Looking downstream (southeast) on Gales Creek. The right bank has alders growing through riprap that was placed after the 1964 flood. Removal of a short section of riprap and placement of a log vane will provide opportunities for the development of a scour pool.

4. Work with property owners near the creek to educate them about programs that promote stream stewardship and that are available to agricultural operations through state and federal grants.

Reach GL03

Existing Conditions

Reach GL03 begins at the confluence with Kelly Creek and extends 1200 feet in a southeasterly direction to a point just upstream of the confluence with Godfrey Creek.

Informal Field Survey completed on 12/9/02. Low flow conditions (approximate flow rate at Highway 47 stream gage = 25 cfs)

Channel Habitat Type: LM (Low Gradient, Moderately Confined)

Adjacent Land Use: Agriculture (Crops) and Extensive Riparian Area

Characteristics:

- *Channel Conditions:* Gravel and cobble substrate. The stream channel is U shaped, but it appears that the creek could access the floodplain. This reach primarily exhibits riffle/glide features. There is a beaver dam at the downstream end of the reach, which was pooling water at the dam to a depth of about 18 inches during low flow conditions. There is about a 70 foot wide gravel bar/island along the left bank near the upstream end of the reach. It appears that the creek may be able to access a significant floodplain along the entire length of the right bank, and the downstream half of the left bank. Five to ten percent of outside banks are eroding with 5 - 10 percent having vertical banks. Average height of eroding banks is approximately 12 feet. The average height is high due to a 20 foot eroding bank just downstream of the confluence with Kelly Creek, near the upstream end of the reach. A majority of the eroding banks are less than 12 feet high. The channel location has not changed significantly between 1994 and 2002. The gradient of the stream within the reach is approximately 0.3 percent. The valley slope is approximately 0.5 percent.
- *Riparian Conditions:* A significant riparian area exists along the left bank. It varies in width from 75 feet to approximately 600 feet. However, this area is dominated by smaller trees (typically alder and some ash), with a few interspersed cottonwood trees. The 2002 aerial photo shows that the trees along the left bank provide excellent morning shade. Shrubs dominate the riparian area along the right bank, with only a narrow (approximately 25 feet) band of alders near the upstream end of the reach. Therefore, the riparian area along the right bank would provide poor afternoon shading. Non-native shrub species such as Japanese knotweed and reed canarygrass dominate the shrub community.
- *Water Quality:* Temperature measurements taken at Roderick Road (the closest temp monitoring location to this reach) show that the largest diurnal temperature change, of any of the monitoring station along Gales Creek, occurred at Roderick Road. It appears likely that solar heating and a lack of riparian vegetation cause the high variability in daily temperatures. Figure 4-1 shows a comparison of diurnal temperatures at three monitoring stations. Lack of potential afternoon shade may be contributing to the high diurnal fluctuation.

- *Water Quantity:* No water supply diversions are noted along this reach. Kelly Creek discharges into Gales Creek at the upstream end of the reach. The Kelly Creek drainage basin area is 218 acres (0.4 percent of total Gales Creek watershed area). Kelly Creek predominately drains agricultural land that is in pasture and annual crops.
- *Habitat Access:* No passage barriers encountered along this reach.
- *Habitat Elements:* No formal habitat survey was completed, however there were observations of beaver activity at the downstream end of the reach. Most of the reach is glide habitat with moderate to high sediment embeddedness. The gravel and cobble within the riffles have very little sediment embeddedness. There are two pools in the reach. However, one is a 4 – 5 foot deep pool that is used as a water withdrawal location during the irrigation season. LWD volume is low throughout the reach.

Degree of Impairment Score = 3.0

Limiting Factors

- Habitat Elements
- Water Quality

Target Functions

- Floodplain Connection – Protect and enhance existing riparian areas through a conservation easement and by planting additional native trees and shrubs.
- In-stream Complexity – Place wood in the stream to provide in-channel habitat diversity, deep pools, and locations with cooler water temperatures during the warm summer months.
- Riparian Zone - Riparian vegetation planting and maintenance in areas along the right bank.

Recommended Actions

1. Work with the landowner to secure a conservation easement for the large riparian area along the left bank. Plant additional cottonwood trees and remove non-native vegetation within this area.
2. Work with the landowner to enhance the riparian areas along the right bank through the planting of additional trees for stream shading.



Photo GL03-1

Looking downstream (south) on Gales Creek. Riparian enhancement in this area with both conifer and deciduous trees would improve stream shading along the west bank. This photo taken in late autumn of 2002 shows low water flow conditions.

3. Increase the in-stream complexity of the channel through the placement of LWD. This work should concentrate near the upstream end of the reach where there is a transition from a riffle into a glide. The work would consist of creating areas with large wood and deep pools that fish can utilize for refuge from high water temperatures. Strategic placement of LWD could also be used to create backwater areas within the extensive riparian areas along the left bank. Specific activities will be determined during the project design phase.
4. Work with property owners near the creek to educate them about programs that promote stream stewardship and that are available to agricultural operations through state and federal grants.

Reach GL04

Existing Conditions

Reach GL04 begins approximately 1,200 feet downstream of the confluence with Kelly Creek and extends 1200 feet in an easterly direction.

Informal Field Survey completed on 12/9/02. Low flow conditions (approximate flow rate at Highway 47 stream gage = 25 cfs)

Channel Habitat Type: LM (Low Gradient, Moderately Confined)

Adjacent Land Use: Extensive Riparian Area and Agriculture (Annual Crops)

Characteristics:

- *Channel Conditions:* 50- 70 percent of outside banks are eroding with 40-50 percent having vertical banks. Average height of eroding banks is approximately 6 feet. Review of the 2002 FSA slides and 1994 aerial photo reveals that sinuosity has decreased through the loss of two meanders in the lower half of the reach. This has resulted in a loss of stream length of approximately 100 feet. Therefore, the stream gradient has increased within the last 8 years. The gradient of the stream within the reach is approximately 0.3 percent. The valley slope is approximately 0.5 percent.
- *Riparian Conditions:* Moderately dense riparian area along right bank (south) which ranges in width from 150 – 300 feet wide. There is an extensive riparian area along the left bank that ranges in width from 500 – 800 feet wide. Riparian trees are primarily alders with a few tall cottonwoods and Oregon ash. 2002 aerial photos show limited shading is being provided by the trees along the right (south) bank due to a lack of large trees growing close to the edge of the creek. One cottonwood is large enough to shade across the stream, while alders and shrubs do not appear to provide adequate shade. There are a limited number of trees that overhang the creek. Understory is a mix of native vegetation (primarily willow and dogwood) with non-native vegetation (primarily Japanese knotweed, Himalayan blackberry, and reed canarygrass). There are limited native shrubs along eroding banks.
- *Water Quality:* Temperature measurements taken at Roderick Road (the closest temp monitoring location to this reach) show that the largest diurnal temperature change, of any of the monitoring station along Gales Creek, occurred at Roderick Road. It appears likely that solar heating and a lack of riparian vegetation cause the high variability in daily temperatures. Figure 4-1 shows a comparison of diurnal temperatures at three monitoring stations. The lack of a dense riparian area along the south bank and the shallow depth of summer low flows may contribute to the high afternoon temperatures.
- *Water Quantity:* No water supply diversions noted along this reach. Godfrey Creek flows into the reach near the upstream end. The Godfrey Creek drainage basin area is 410 acres (0.8 percent of the total Gales Creek watershed area). Godfrey Creek drains an agricultural area that is

predominately farmed with annual crops and private forest lands that were logged sometime between 1994 and 1998.

- *Habitat Access:* No natural or structural passage barriers encountered along this reach.
- *Habitat Elements:* No formal habitat survey was completed, however there were observations of beaver activity. Beavers had recently dug small holes in the gravel bar to eat the roots of some unidentified plant. The reach has a gravel and cobble substrate and exhibits riffle/pool habitat types. There is a central gravel bar near the downstream end of the reach that splits the creek into two channels during low flows. This is causing lateral movement of the channel towards both the left and right banks, which are being eroded. Erosion along many of the outside banks was evident. There is an extensive gravel point bar on the left bank for most of the reach. There is minimal shrub growth – 50/50 native and non-native on the point bar. There is a large log jam near the upstream end of the reach. This has caused pressure and erosion on the outside bank. An island has formed about 100 feet upstream of the log jam. An active beaver dam exists near the confluence with Godfrey Creek.

Degree of Impairment Score = 2.8

Limiting Factors

- Riparian Conditions
- Water Quality

Target Functions

- Floodplain Connection – Protect and enhance existing riparian areas by planting additional native trees and shrubs and removing non-native species.
- Riparian Zone - Riparian vegetation planting and maintenance in areas along the right bank to address water temperature issues.

Recommended Actions

1. Work with the landowner to secure a conservation easement for the large riparian areas along the left and right banks. Plant additional cottonwood trees and remove non-native vegetation within this area.
2. This reach is highly dynamic, as seen on the aerial photo, by the change in the channel location between 1998 and 2002. The outside bank is eroding along much of the reach. There is an extensive riparian area adjacent to the eroding bank so it is not endangering any structures. Access would be difficult for any equipment required to stabilize the bank. Therefore, it is recommended to let the stream self adjust within this reach.



Photo GL04-1
Looking downstream (southeast) on Gales
Creek. Note the eroding bank and growth of
Himalayan blackberries.

3. Work with property owners near the creek to educate them about programs that promote stream stewardship and that are available to agricultural operations through state and federal grants.

