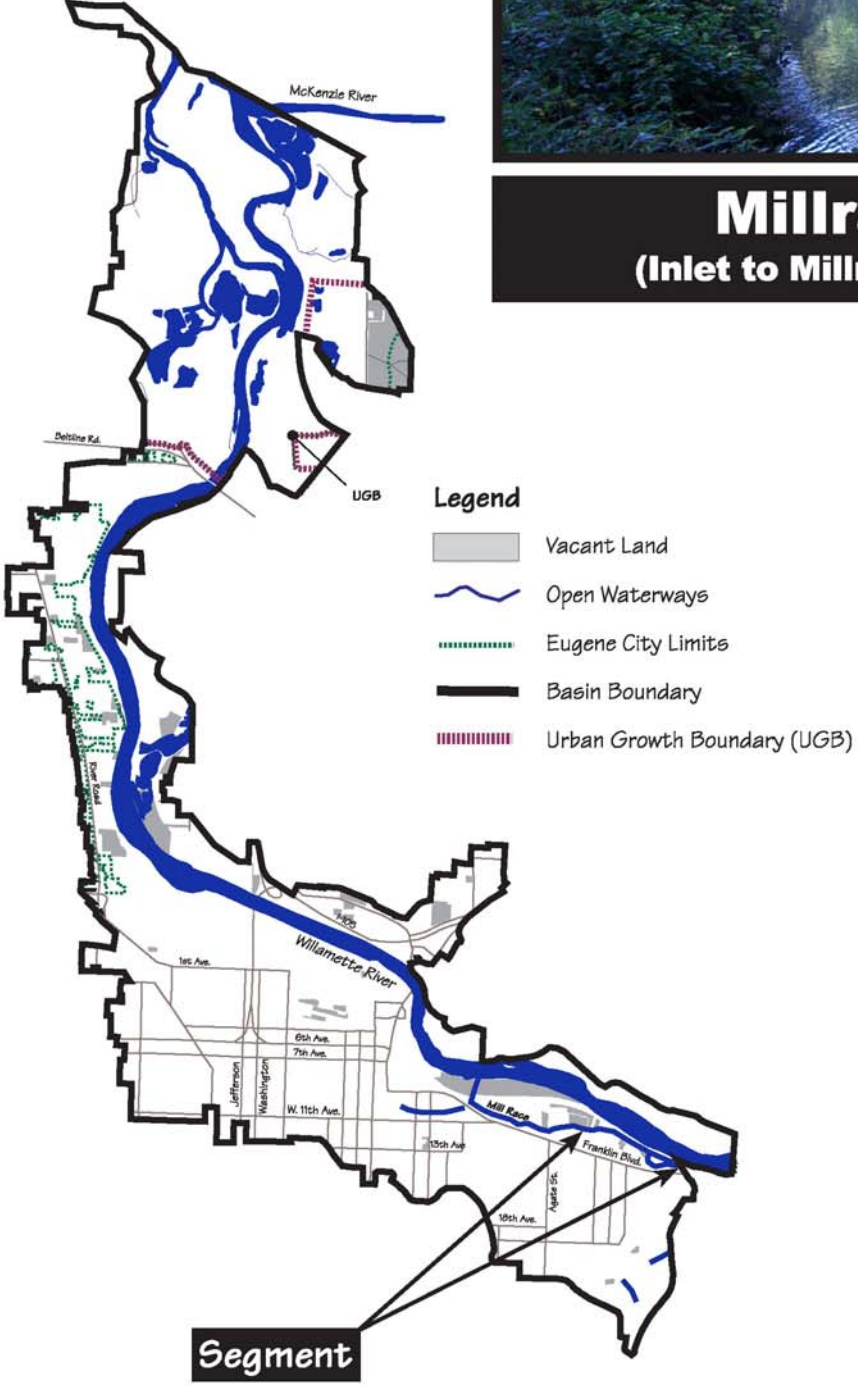




**Millrace  
(Inlet to Millrace Drive)**



## Millrace (Inlet to Millrace Drive)

<b>Basin:</b>	Willamette River
<b>SW System Map Page(s):</b>	79
<b>General location:</b>	West from pump station downstream from Knickerbocker Bridge to Millrace Drive.
<b>Upstream terminus:</b>	Outlet of pump station into Franklin Park.
<b>Downstream terminus:</b>	Inlet of box culvert under Millrace Drive, node point #74801.
<b>Approximate length:</b>	3,100'
<b>Flow persistence:</b>	Perennial

### I. General Description

#### A. Location

This channel carries water from the Willamette River toward the millrace duck pond. Water flows west from the pump station outlet into Franklin Park. It continues west around the Quality Inn and Suites and parallels the Southern Pacific Railroad tracks. The channel flows west under the building at 1907 Garden Avenue, then into a short culvert, after which the channel daylights and flows through private property to Millrace Drive. The entirety of this watercourse parallels the Willamette River and is separated from it primarily by the raised path of the railway.

#### B. Physical Characteristics

This slow-flowing, perennial waterway is controlled by a pumping station west of the Knickerbocker Footbridge and weir controls at two inlet structures near the millrace duck pond. Water levels are managed by the University of Oregon to provide adequate water for their steam plant. This reach of the waterway has a natural bottom and sides. It is relatively shallow and narrow, constrained on the south bank by developments that often hang over the channel or come directly in contact with the channel. The north bank is constrained by the railway and overhead utility rights-of-way.

SCS soils maps indicate that soils along this waterway consist primarily of disturbed Chapman-Urban land complex. The Chapman soil complex is found on low river terraces. It is moderately permeable with slow runoff and low water erosion hazard.

#### C. Vegetation

Vegetation along this channel consists primarily of shrubby riparian species dominated primarily by Armenian blackberry (*Rubus armeniacus*). From the point where the waterway leaves the natural channel through Franklin Park, the channel vegetation becomes constrained to the banks. The steep south bank is developed with buildings and parking lots coming in close proximity to the channel. The remaining undeveloped bank is dominated by blackberry with some overstory trees such as red alder (*Alnus rubra*), big-leaf maple (*Acer macrophyllum*), black cottonwood (*Populus trichocarpa*), Lombardy poplar (*Populus nigra*), willows (*Salix* sp.), and escaped pear or apple trees (*Pyrus* sp.). The south bank is constrained by the railroad right-of-way and the

adjacent access road. While slightly less constrained than the south bank, the vegetation is similar.

The section of the waterway flowing through Franklin Park is wide and shallow with a dense growth of primarily native trees and shrubs. However, populations of exotic species, especially Armenian blackberry and English ivy (*Hedera helix*), are prevalent. English ivy, in particular, is well established on tree trunks.

#### **D. Physical Access**

Access to this channel is limited. The upstream section of the waterway through Franklin Park is accessible along the paved bike path. Developed vegetation will make access by large equipment challenging. The section to the west of Franklin Park is accessible only from the gravel road parallel to the railroad tracks. This road can be accessed through the driveway at 1907 Garden Avenue. Again, significant vegetation between the road and channel will make access difficult. The final section to the west of 1907 Garden Avenue traverses private land and is virtually inaccessible except for a small section that can be reached from Millrace Drive.

Despite this limited direct access to the channel, maintenance efforts may be improved through control of the water level. Coordination with the University of Oregon to turn off upstream water pumps will allow the channel to drain. Reducing water flows can be used to provide crew access to remove debris and trash from the channel by hand.

## **II. Management Concerns**

### **A. Conveyance Issues**

There are no known conveyance concerns along this reach. All flows are controlled by the pump station managed by the University of Oregon. Two large outfalls ensure drainage.

### **B. Water Quality Issues**

This channel receives stormwater from street and parking lot, residential, industrial and commercial sources. Diverse point and non-point sources of pollution in this waterway are likely to contribute to lowered water quality along this reach. Much of the open channel is adequately shaded by mature trees and buildings, reducing concerns of high water temperatures faced by many open channels in the city. Water quality concerns along this channel are a priority due to its direct connection with the Willamette River.

### **C. Natural Resources Issues**

This reach of the Millrace provides some important natural resource benefits, especially through Franklin Park. This section of the waterway is surrounded by well-established native trees and shrubs along with important standing snags and downed logs. This structure provides important refugia and food sources for diverse wildlife species. However, Armenian blackberry and English ivy are important threats to this area.

The section downstream from Franklin Park provides much lowered natural resource values. Mature trees and shrubs that line the banks provide habitat and travel corridors for waterfowl and other wildlife. The water course contains fallen woody debris, which provides habitat for in-stream organisms. However, human impacts and developments that directly abut the channel along most of its length have diminished natural resource values along the entirety of this reach.

The proximity of this watercourse to the Willamette River is worth noting. This section of the Millrace may be an important refuge, providing habitat for species also using the Willamette River.

### **III. Maintenance**

#### **A. Objectives**

There has been little historic maintenance of this reach, primarily due to the lack of access. However, efforts should be made to maintain conveyance through removal of obstructions, debris, and trash. Natural woody debris should be left as long as it does not pose a threat to conveyance. Efforts to control invasive species, such as English ivy, will benefit natural resource values of this channel and others downstream (including the Willamette River). Exotic species management is especially important for the Franklin Park area, which has a high natural resource value. Attempt to improve other natural resource values as opportunities arise.

#### **B. Scheduled Maintenance**

1. *Inspection* - Inspection of this waterway should be conducted semiannually. Early fall inspections should evaluate potential conveyance concerns, bank stability, and accessibility concerns. Spring inspections should assess winter erosion damage and schedule any maintenance required to remedy such damage. Other issues to note include:

- Channel geomorphological changes, including sediment bar development.
- Location of potential future bank failures.
- Development and maintenance of streamside vegetation.
- Physical access concerns for equipment.
- Usage of stream resources by animals.
- Quality of flowing water.
- Condition of installed structures (culverts, etc.).
- Presence of trash and debris.
- Presence and location of target exotic species.

2. *Sediment removal* - The need for sediment removal is unlikely along this reach. Accumulating sediment bars should be permitted to develop as long as conveyance is not hindered and undermining of adjacent structures is not a risk.

3. *Litter/trash removal* - Crews should conduct inspections and remove accumulated or dumped litter/trash annually. Sources of residential or commercial dumping should be identified and discouraged. Because this reach is proximate to residential and commercial properties, hazardous materials and debris should be removed quickly. There is significant transient activity in this area. Camps should be posted and trash cleaned annually.

4. *Vegetation* - Natural resource values will be enhanced through efforts to control invasive species, such as English ivy. Efforts to control exotic species affecting the channel should emphasize Franklin Park first and the rest of the channel secondarily.

Mature trees along the channel may fall or lose limbs into the channel. These should be left in place as long as conveyance and recreation activities will be feasible.

5. *Structure clearing* - Most of the structures along this stretch are large and are unlikely to clog as long as ongoing litter/trash removal efforts described above are conducted.

### **C. Non-Scheduled Maintenance**

1. *Bank stabilization* - Bank stabilization is not a major concern along this low-gradient water body. However, some of the buildings are precariously close to the channel, and some evidence of undermining is present.

2. *Blockage removal* - Blockages are unlikely with the regular scheduled maintenance described above.

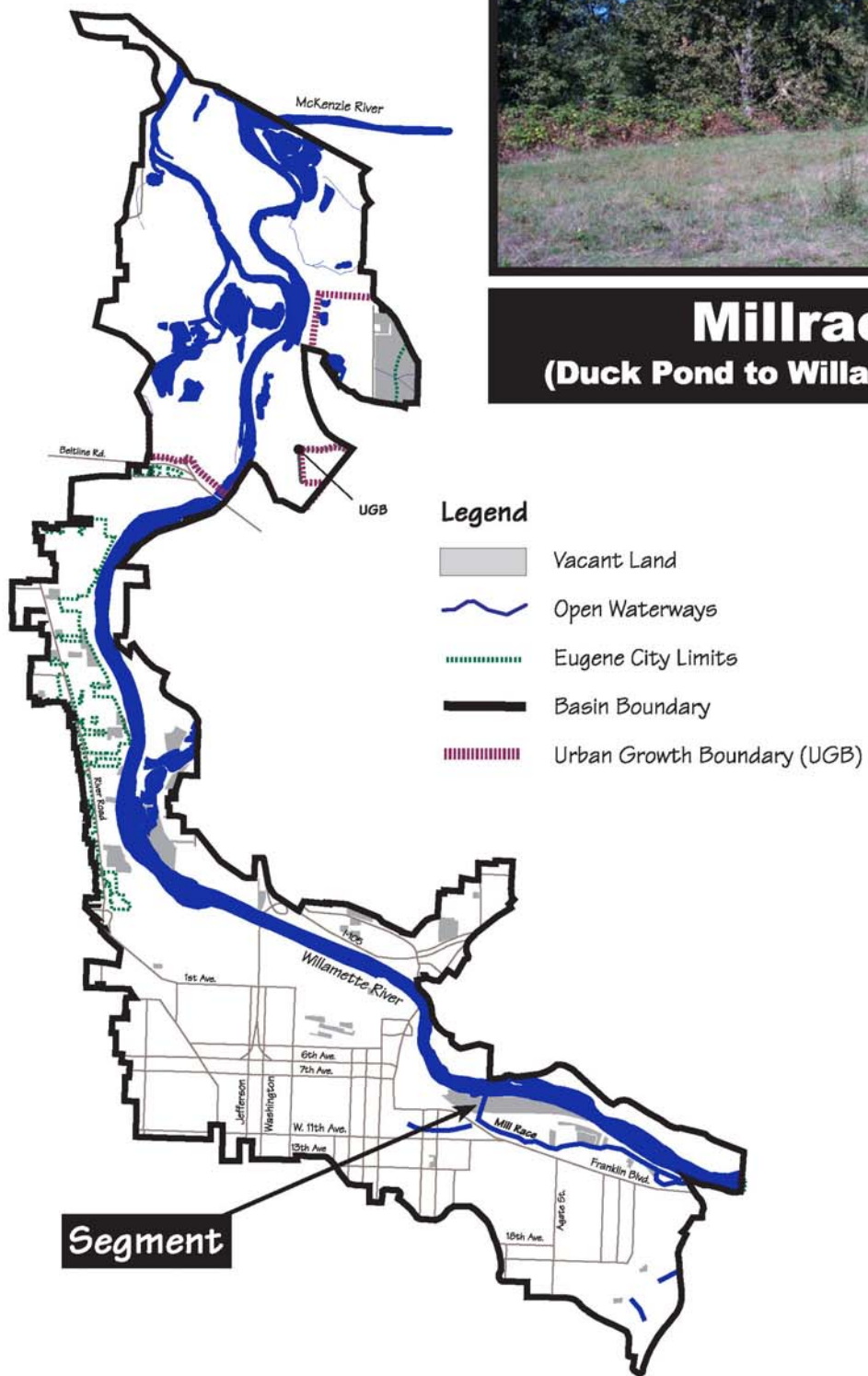
3. *Structure repair* - No structure deterioration was evident, and it is unlikely that repairs in the next 10 years will be required.

### **IV. Potential Future Capital Projects**

None identified for this reach.



## Millrace (Duck Pond to Willamette River)



## Millrace (Duck Pond to Willamette River)

<b>Basin:</b>	Willamette River
<b>Index page(s):</b>	66, 67
<b>General location:</b>	North from the University's duck pond to the Willamette River.
<b>Upstream terminus:</b>	Outlet of the duck pond to the north.
<b>Downstream terminus:</b>	Willamette River.
<b>Approximate length:</b>	575'
<b>Flow persistence:</b>	Perennial

### I. General Description

#### A. Location

This channel carries water from the millrace duck pond to the Willamette River. This channel commences at the northeastern outlet to the millrace duck pond, flows under the railroad tracks, and then daylights. It then flows through a large box culvert, daylights, enters a smaller pipe culvert under the bike path, daylights again and remains open to its terminus at the Willamette River. The total run of the waterway is approximately 575'.

#### B. Physical Characteristics

This small fast-flowing perennial waterway is controlled by a pumping station west of the Knickerbocker Footbridge and weir controls at its inlet structure at the northeast side of the millrace duck pond. Water levels are managed by the University of Oregon to provide adequate water for their steam plant. This reach of the waterway has a natural bottom and sides. It is relatively shallow and narrow.

SCS soils maps indicate that soils along this waterway consist primarily of Chapman-Urban land complex and Newburg urban land complex. Both soils types are highly disturbed. The Chapman soil complex is found on low river terraces. It is moderately permeable with slow runoff and low water erosion hazard. The Newburg complex is found on floodplains. It is moderately well-drained, runoff is slow, and the hazard of water erosion is slight.

#### C. Vegetation

Vegetation along this channel consists primarily of well-established riparian tree and shrub species dominated by Armenian blackberry (*Rubus armeniacus*). The mature and well-developed overstory includes native species, such as black cottonwood (*Populus trichocarpa*), Oregon ash (*Fraxinus latifolia*), red alder (*Alnus rubra*), willow (*Salix* sp.), and red osier dogwood (*Cornus stolonifera*). The shrubby understory is dominated by Armenian blackberry but also contains fennel (*Foeniculum vulgare*), snowberry (*Symphoricarpos* sp.), poison oak (*Toxicodendron diversiloba*), and English ivy (*Hedera helix*) among others.

#### **D. Physical Access**

Access to this channel is very limited. A gravel road parallels the west bank of this reach. However, the steep, well-vegetated banks are difficult to access from this location. The only other access points are (1) to the channel from the paved bicycle path and (2) to the outlet structure from the graveled right-of-way on the south side of the railroad tracks.

Despite this limited direct access to the channel, maintenance efforts may be improved through control of the water level. Coordination with the University of Oregon to close the inlet structure will allow the channel to drain. Reducing water flows can be used to provide crew access to remove debris and trash from the channel by hand.

#### **E. Legal Access**

*Unknown at this time.*

### **II. Management Concerns**

#### **A. Conveyance Issues**

There are no known conveyance concerns along this reach. All flows are controlled by the pump station managed by the University of Oregon. The drainage has the capacity to handle significant flows.

#### **B. Water Quality Issues**

This channel receives stormwater from street and parking lot, residential, industrial and commercial sources. Diverse point and non-point sources of pollution in this waterway are likely to contribute to lowered water quality along this reach. Much of the open channel is adequately shaded by mature trees and buildings, reducing concerns of high water temperatures faced by many open channels in the city. Water quality concerns along in this channel are a priority due to its direct connection with the Willamette River.

#### **C. Natural Resources Issues**

This reach of the Millrace provides important natural resource benefits. This waterway is surrounded by well-established native trees and shrubs along with important standing snags and downed logs. This structure provides important refugia and food sources for diverse wildlife species. However, Armenian blackberry and English ivy are important threats to this area. The proximity of this watercourse to the Willamette River is worth noting. This section of the Millrace may be an important refuge, providing habitat for species also using the Willamette River, including juvenile salmon, which may use the lowest reaches of this channel.

### **III. Maintenance**

#### **A. Objectives**

There has been little historic maintenance of this reach primarily due to the lack of legal and physical access. Maintenance that has occurred has been conducted primarily by University crews and has required little City involvement. However, when City of Eugene staff are engaged to work on this reach, efforts should be made to maintain conveyance through removal of significant obstructions, debris, and trash. Natural woody debris should be left as long as it does not pose a threat to conveyance. Efforts to control invasive species, such as English ivy, will benefit natural resource values of this channel and others downstream (including the Willamette River). Attempt to improve other natural resource values as opportunities arise. Camping and other usage that results in trash and debris accumulation at the confluence of this reach with the



Willamette River should be discouraged.

## **B. Scheduled Maintenance**

1. *Inspection* - Inspection of this waterway should be conducted semiannually. Early fall inspections should evaluate potential conveyance concerns, bank stability, and accessibility concerns. Spring inspections should assess winter erosion damage and schedule any maintenance required to remedy such damage. Other issues to note include:

- Channel geomorphological changes, including sediment bar development.
- Location of potential future bank failures.
- Development and maintenance of streamside vegetation.
- Physical access concerns for equipment.
- Usage of stream resources by animals.
- Quality of flowing water.
- Condition of installed structures (culverts, etc.).
- Presence of trash and debris.
- Presence and location of target exotic species.

2. *Sediment removal* - The need for sediment removal is unlikely along this reach. Accumulating sediment bars should be permitted to develop as long as conveyance is not hindered and undermining of adjacent structures is not a risk.

3. *Litter/trash removal* - Crews should conduct inspections and remove accumulated or dumped litter/trash annually. Sources of transient and recreational dumping should be identified and discouraged. Because this reach is proximate to a frequently used recreational area, hazardous materials and debris should be removed quickly. There is significant transient activity in this area. Camps should be posted and trash cleaned annually.

4. *Vegetation* - Natural resource values will be enhanced through efforts to control invasive species, such as English ivy and Armenian blackberry.

Mature trees along the channel may fall or lose limbs into the channel. These should be left in place as long as conveyance and recreation activities will be feasible.

5. *Structure clearing* - Most of the structures along this stretch are large and are unlikely to clog as long as ongoing litter/trash removal efforts described above are conducted. Particular attention should be paid to the 24" culvert under the bicycle path.

## **C. Non-Scheduled Maintenance**

1. *Bank stabilization* - Bank stabilization is not a major concern along this waterway.

2. *Blockage removal* - Blockages are unlikely with the regular scheduled maintenance described above. However, occasional blockage of the 24" culvert under the bicycle path may occur, and the culvert should be inspected annually.

3. *Structure repair* - There was evidence of deterioration of the 24" culvert under the bicycle path; however, it is still quite functional, and it is unlikely that repairs in the next 10 years will be required.

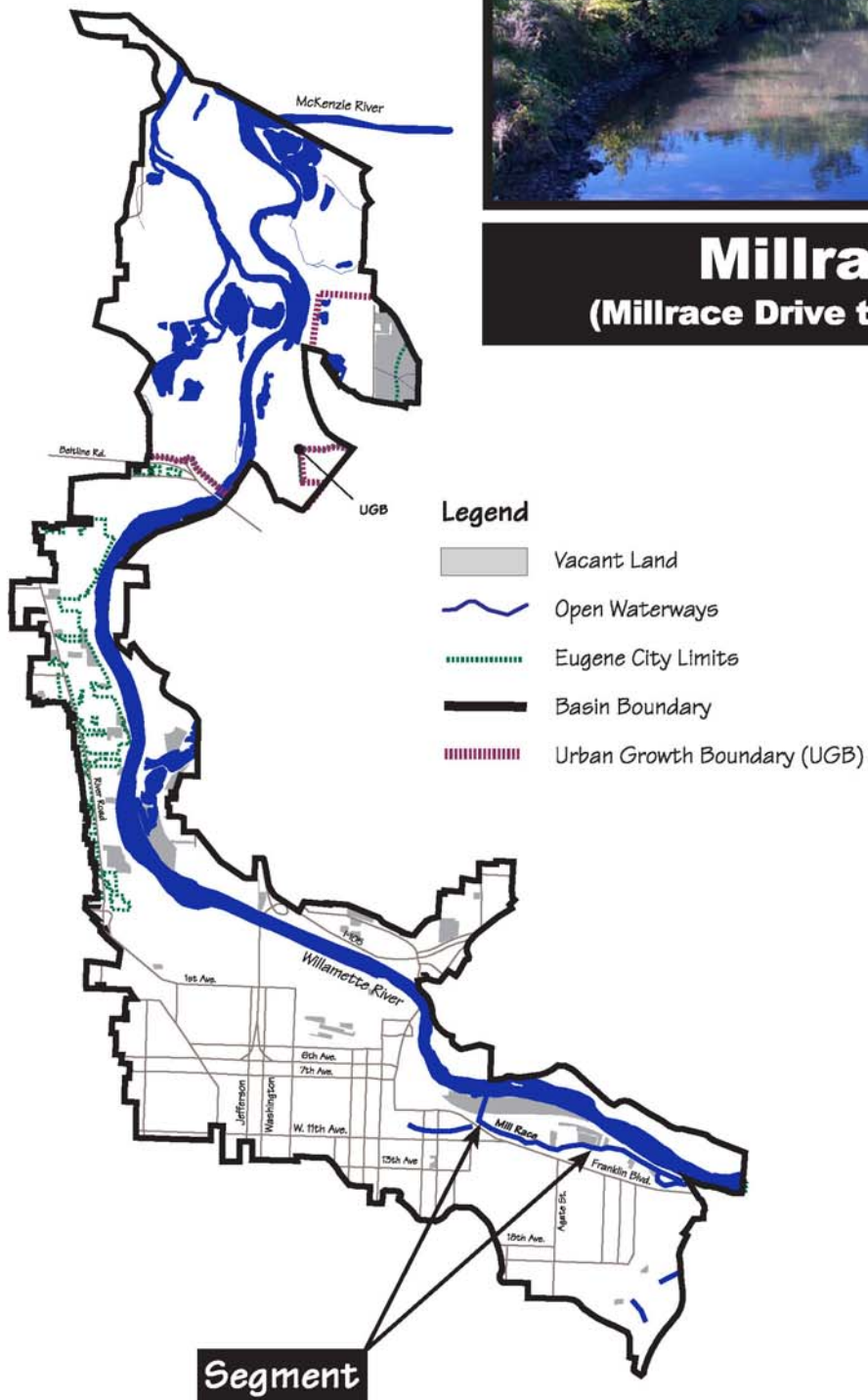
#### **IV. Potential Future Capital Projects**

1. Replace 24" culvert under bicycle path with box culvert to improve fish passage to the rest of this reach.



# Millrace

(Millrace Drive to Franklin)



## Millrace (Millrace Drive to Franklin Boulevard)

<b>Basin:</b>	Willamette River
<b>SW System Map Page(s):</b>	67, 79
<b>General location:</b>	West under Millrace Drive to box culvert under Franklin Boulevard
<b>Upstream terminus:</b>	West side of box culvert under Millrace Drive, node point #74802.
<b>Downstream terminus:</b>	Inlet of canoe-accessible box culvert under Franklin Boulevard, node point #57174.
<b>Approximate length:</b>	3500'
<b>Flow persistence:</b>	Perennial

### I. General Description

#### A. Location

This channel carries water to the millrace duck pond. Water flows west through a canoe-accessible culvert under Millrace Drive. It continues west under Riverfront Parkway, a University-owned bike bridge and driveway before entering the duck pond. The duck pond has two outlets. The primary outlet flows under Franklin Boulevard on the southwest side of the pond. On the northwest side of the pond, another outfall leads into a short open waterway which flows directly north to the Willamette River.

#### B. Physical Characteristics

This slow-flowing, perennial waterway is controlled by a pumping station west of the Knickerbocker Footbridge and weir controls at two inlet structures. One structure is in the millrace duck pond and regulates water flowing north to the Willamette River. The other structure is at the west end of the concrete portion of the millrace to the west of Patterson Street. Water levels are managed by the University of Oregon to provide adequate water for their steam plant.

SCS soils maps indicate that soils along this waterway consist primarily of Chapman-Urban land complex and Newburg urban land complex. Both soils types are highly disturbed. The Chapman soil complex is found on low river terraces. It is moderately permeable with slow runoff and low water erosion hazard. The Newburg complex is found on floodplains. It is moderately well-drained, runoff is slow, and the hazard of water erosion is slight.

#### C. Vegetation

Vegetation along this channel consists primarily of maintained landscaping materials such as ornamental plants and lawns. Several mature trees provide shade to the channel and include species such as big-leaf maple (*Acer macrophyllum*), lodgepole pine (*Pinus contorta*), weeping willow (*Salix babylonica*), and alder (*Alnus* sp.) among others. English ivy (*Hedera helix*) and Armenian blackberry (*Rubus armeniacus*) are well-established exotic species along the waterway.

## **D. Physical Access**

Access to this channel is limited. All-weather nodal access is available from road crossings including Millrace Drive, Riverfront Parkway, and the University of Oregon's bike bridge (near the canoe house) and driveway (near the duck pond). There is also limited linear access from the paved bike path that meanders along the north side of the channel from the duck pond driveway to Millrace Drive. However, in most places the bike path is not directly adjacent to the channel-limiting equipment access to the channel from the path. Thus, the bike path may be a valuable all weather haul route but may not be useful as an access point to the channel for large equipment such as the Gradall.

Despite this limited direct access to the channel, maintenance efforts may be improved through control of the water level. Coordination with the University of Oregon to turn off upstream water pumps will allow the channel to drain. Reducing water flows can be used to provide crews access to remove debris and trash from the channel by hand.

## **II. Management Concerns**

### **A. Conveyance Issues**

There are no known conveyance concerns along this reach. All flows are controlled by the pump station managed by the University of Oregon. Two large outfalls ensure drainage.

### **B. Water Quality Issues**

This channel receives stormwater from street and parking lot, residential, industrial and commercial sources. Diverse point and non-point sources of pollution in this waterway are likely to contribute to lowered water quality along this reach. In addition, resident waterfowl at the duck pond may be contributing to seasonal raised fecal coliform levels. However, a mid-summer water sample tested by the Metro Wastewater Treatment Division (7/00) at downstream locations did not detect fecal coliform. Much of the open channel is adequately shaded by mature trees and buildings, reducing concerns of high water temperatures faced by many open channels in the city. Water quality concerns along in this channel are a priority due to its direct connection with the Willamette River.

### **C. Natural Resources Issues**

This reach of the Millrace provides some natural resource benefits. Mature trees that line the banks provide habitat for waterfowl and other wildlife. The water course contains fallen woody debris, which provides habitat for in-stream organisms. However, human impacts and developments that directly abut the channel along most of its length have diminished natural resource values along the entirety of this reach.

## **III. Maintenance**

### **A. Objectives**

Most of this reach is currently maintained by University crews and requires little City involvement. However, when City of Eugene staff are engaged to work on this reach, efforts should be made to maintain conveyance and aesthetic values through removal of obstructions, debris, and trash. Efforts to control invasive species, such as English ivy, will benefit natural resource values of this channel and others downstream (including the Willamette River). Residents adjacent to the channel should be engaged in education and volunteer clean-up efforts to improve local knowledge of water quality issues and reduce sources of pollution. Attempt to

improve natural resource values as opportunities arise. For example, allow woody debris to accumulate to improve habitat structure as long as conveyance can be ensured.

## **B. Scheduled Maintenance**

1. *Inspection* - Inspection of this waterway should be conducted semiannually. Early fall inspections should evaluate potential conveyance concerns, bank stability, and accessibility concerns. Spring inspections should assess winter erosion damage and schedule any maintenance required to remedy such damage. Other issues to note include:

- Presence of trash and debris.
- Usage of stream resources by animals.
- Quality of flowing water.
- Condition of installed structures (culverts, etc.).
- Presence and location of target exotic species.

2. *Sediment removal* - The relatively fast flows of this reach make sediment removal unlikely along this reach. Accumulating sediment bars should be permitted to develop as long as conveyance is not hindered and undermining of adjacent structures is not a risk.

3. *Litter/trash removal* - Crews should conduct inspections and remove accumulated or dumped litter/trash annually. Sources of residential dumping should be identified and discouraged. Because this reach is proximate to residential properties, hazardous materials and debris should be removed quickly.

4. *Vegetation* - Natural resource values will be enhanced through efforts to control invasive species, such as English ivy. However, most City efforts will be preempted by University maintenance activities. Efforts to control exotic species affecting the channel but located on University and private property will need to be encouraged through education and volunteer activities.

Mature trees along the channel may fall or lose limbs into the channel. These should be left in place as long as conveyance and recreation activities will be feasible.

5. *Structure clearing* - Most of the structures along this stretch are large and are unlikely to clog as long as ongoing litter/trash removal efforts described above are conducted.

## **C. Non-Scheduled Maintenance**

1. *Bank stabilization* - Bank stabilization is not a major concern along this low-gradient water body. However, some of the buildings are precariously close to the channel, and some evidence of undermining is present.

2. *Blockage removal* - Blockages are unlikely with the regular scheduled maintenance described above.

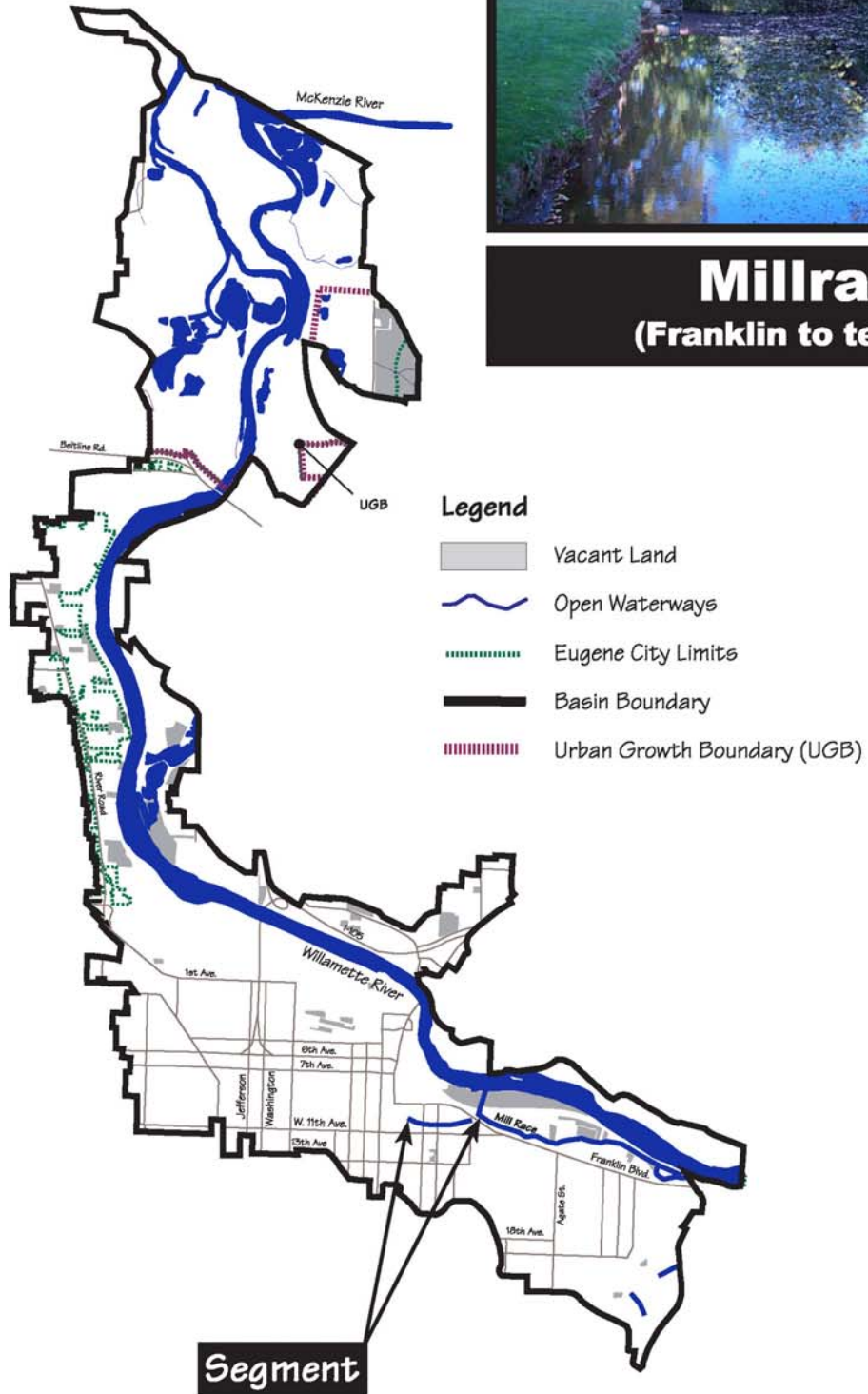
3. *Structure repair* - No structure deterioration was evident, and it is unlikely that repairs in the next 10 years will be required.

## **IV. Potential Future Capital Projects**

None identified for this reach.



# Millrace (Franklin to terminus)



## Millrace (Franklin Boulevard to Terminus)

<b>Basin:</b>	Willamette River
<b>SW System Map Page(s):</b>	67
<b>General location:</b>	Outfall of box culvert under Franklin Boulevard to dual box culvert inlets west of Patterson Street.
<b>Upstream terminus:</b>	Outfall of canoe-accessible box culvert under Franklin Boulevard; node point #57175.
<b>Downstream terminus:</b>	Inlet of dual box culverts west of Patterson Street; node point #57269.
<b>Approximate length:</b>	1,775'
<b>Flow persistence:</b>	Perennial

### I. General Description

#### A. Location

This waterway flows west from a canoe-accessible culvert under Millrace Drive. It crosses under Alder Street, Hilyard Street, two foot bridges, and Patterson Street before entering dual box culverts to the west of Patterson Street.

#### B. Physical Characteristics

This slow-flowing perennial waterway is controlled by a pumping station west of the Knickerbocker Footbridge and weir controls at two inlet structures. One structure is in the millrace duck pond and regulates water flowing north to the Willamette River. The other structure is at the west end of the concrete portion of the millrace to the west of Patterson Street. Water levels are managed by the University of Oregon to provide adequate water for their steam plant.

SCS soils maps indicate that this reach consists of Malabon urban land complex soils. These highly disturbed soils may be moderately well-drained with moderately slow permeability. Runoff is slow-and the hazard of water erosion is slight.

#### C. Vegetation

Vegetation along this channel consists primarily of maintained landscaping materials such as ornamental plants and lawns. Several mature trees provide shade to the channel and include species such as big-leaf maple (*Acer macrophyllum*), lodgepole pine (*Pinus contorta*), weeping willow (*Salix babylonica*), and alder (*Alnus* sp.) among others. English ivy (*Hedera helix*) planted in one area appears to be rapidly ascending and overtaking several trees. The water course is dominated by an exotic species of *Elodea*.



## **D. Physical Access**

Access to this channel is extremely limited. Nodal access is available from road crossings including Franklin Boulevard, Alder Street, Hilyard Street, and Patterson Street. There is also limited access from two alleys on the north side of the channel between Alder and Hilyard Streets and between Hilyard and Patterson Streets. There are also two wooden footbridges over the channel between Hilyard and Patterson Streets. The downstream culvert outlet is accessible from the rear of the hotel at 476 E. Broadway Avenue.

Despite limited linear access along the channel banks, access to the channel bottom is feasible. Coordination with the University of Oregon to turn off upstream water pumps will allow the channel to drain. Reducing water flows has been used to provide volunteer groups access to remove debris and trash from the channel by hand.

## **II. Management Concerns**

### **A. Conveyance Issues**

There are no known conveyance concerns along this reach. All flows are controlled by the pump station managed by the University of Oregon. Two large outfalls ensure drainage.

### **B. Water Quality Issues**

This channel receives stormwater from street and parking lot, residential, industrial and commercial sources. Diverse point and non-point sources of pollution in this waterway are likely to contribute to lowered water quality along this reach. In addition, resident waterfowl upstream at the duck pond may be contributing to seasonal raised fecal coliform levels. However, a mid-summer water sample tested by the Metro Wastewater Treatment Division (7/00) did not detect fecal coliform. Much of the open channel is adequately shaded by mature trees, reducing concerns of high water temperatures faced by many open channels in the city. Water quality concerns along in this channel are a priority due to its direct connection with the Willamette River.

### **C. Natural Resources Issues**

This reach of the Millrace does not provide significant natural resource benefits. The channel bottom is concrete reducing the habitat for microorganisms and invertebrates that may contribute to improved water quality. The water course itself is primarily dominated by exotic aquatic vegetation. The banks are concrete and bank tops manicured landscaping. Some of the mature trees along the channel may be providing valuable habitat for birds, squirrels, and insects. Human impacts and developments have diminished natural resource values along the entirety of this reach.

## **III. Maintenance**

### **A. Objectives**

Maintain conveyance and aesthetic values through removal of obstructions, debris, and trash. Efforts to control invasive species, such as *Elodea* and English ivy, will benefit natural resource values of this channel and others downstream (including the Willamette River). Residents adjacent to the channel should be engaged in education and volunteer clean-up efforts to improve local knowledge of water quality issues and reduce sources of pollution.

### **B. Scheduled Maintenance**

1. *Inspection* - Inspection of this waterway should be conducted semiannually. Early fall

inspections should evaluate potential conveyance concerns, bank stability, and accessibility concerns. Spring inspections should assess winter erosion damage and schedule any maintenance required to remedy such damage. Other issues to note include:

- Presence of trash and debris.
- Usage of stream resources by animals.
- Quality of flowing water.
- Condition of installed structures (culverts, etc.).
- Presence and location of target exotic species.

2. *Sediment removal* - The relatively fast flows of this concrete-lined reach make sediment removal unlikely along this reach. Accumulating sediment bars should be permitted to develop as long as conveyance is not hindered.

3. *Litter/trash removal* - Crews should conduct bi-weekly inspections and remove accumulated or dumped litter/trash at the pipe outlet behind the hotel at 476 E. Broadway Avenue. The rest of the channel should be inspected semiannually, and sources of residential dumping should be identified and discouraged. Because this reach is proximate to residential properties, hazardous materials and debris should be removed frequently.

4. *Vegetation* - Natural resource values will be enhanced through efforts to control invasive species, such as English ivy and *Elodea*. However, most City efforts will be prevented by limited access to private property. Efforts to control exotic species affecting the channel but located on private property will need to be encouraged through education and volunteer activities.

Mature trees along the channel may fall or lose limbs into the channel. These should be removed.

5. *Structure clearing* - Most of the structures along this stretch are large and are unlikely to clog as long as ongoing litter/trash removal efforts described above are conducted.

### **C. Non-Scheduled Maintenance**

1. *Bank stabilization* - Bank stabilization is not a major concern along this slow-moving, low-gradient water body. Most of the channel is concrete-lined. The short natural bank section is heavily maintained by private owners.

2. *Blockage removal* - Blockages are unlikely with the regular scheduled maintenance described above.

3. *Structure repair* - No structure deterioration was evident, and it is unlikely that repairs in the next 10 years will be required.

## **IV. Potential Future Capital Projects**

1. See *1990 Millrace Enhancement Feasibility Study* and *Downtown Visioning Statement*. Daylighting the piped section from the outlet downstream is currently being considered.

2. Consider placement of a water quality improvement facility at the downstream pipe inlet.