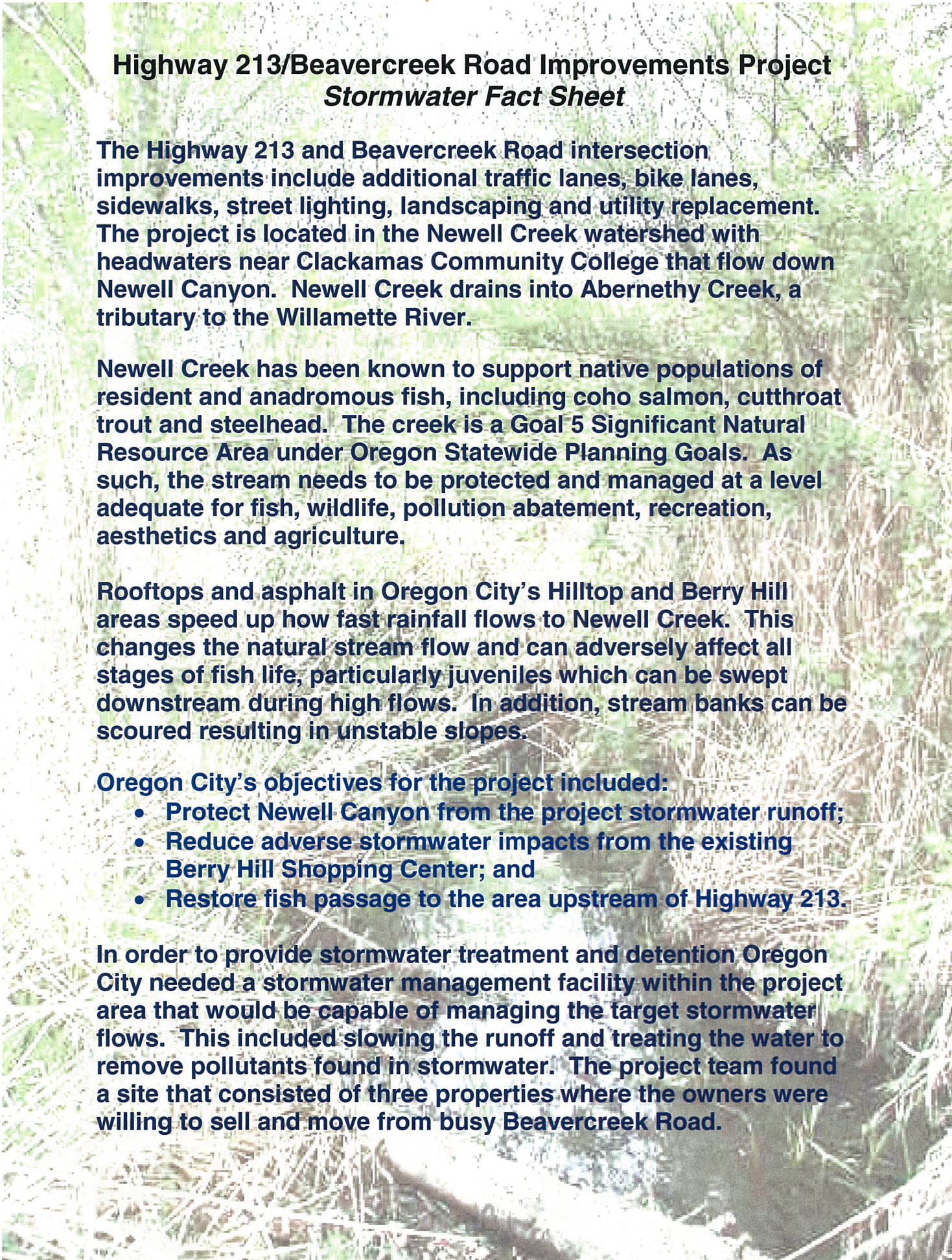




## **Highway 213/Beavercreek Road Improvements Project**

### ***Stormwater Fact Sheet***

The Highway 213 and Beavercreek Road intersection improvements include additional traffic lanes, bike lanes, sidewalks, street lighting, landscaping and utility replacement. The project is located in the Newell Creek watershed with headwaters near Clackamas Community College that flow down Newell Canyon. Newell Creek drains into Abernethy Creek, a tributary to the Willamette River.

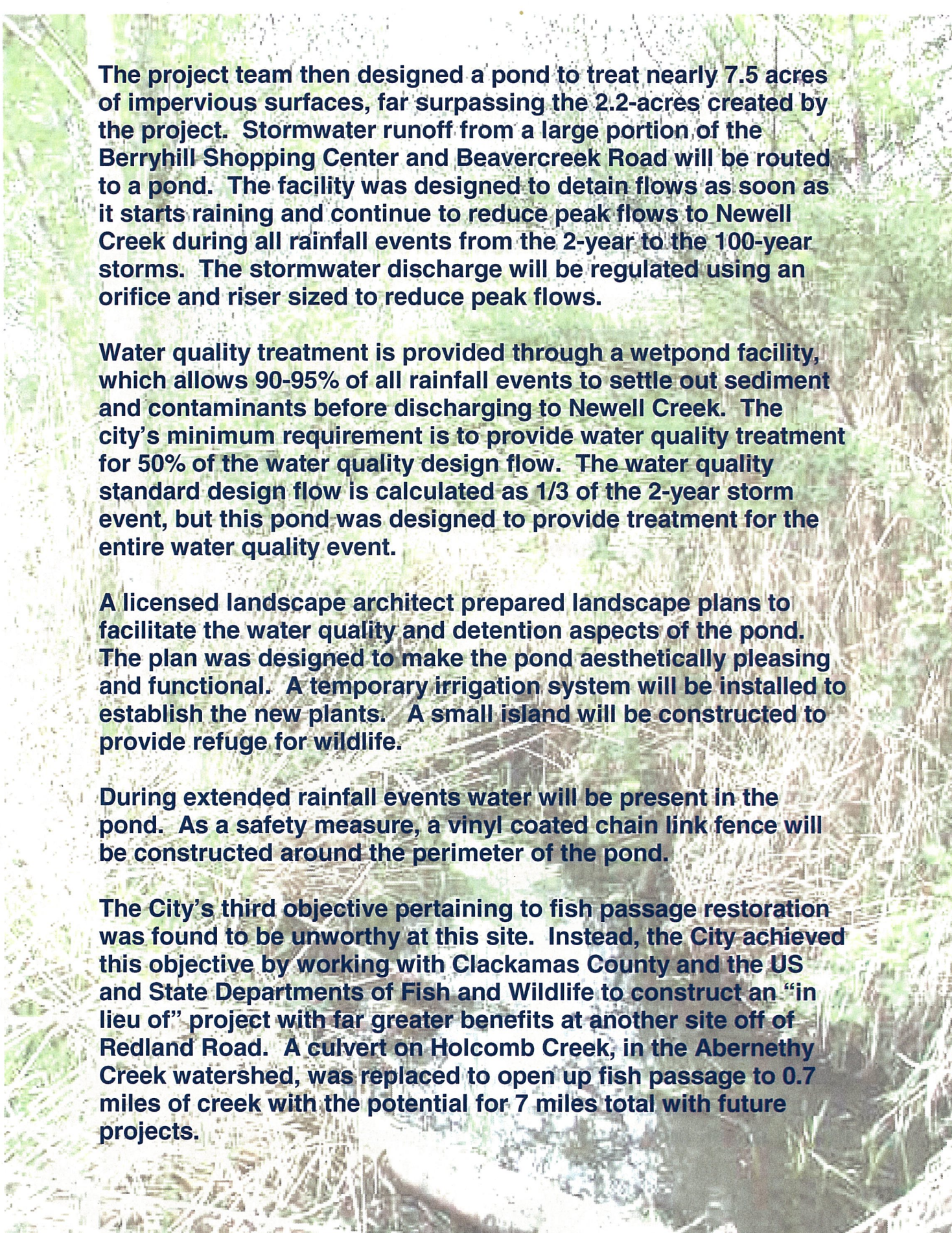
Newell Creek has been known to support native populations of resident and anadromous fish, including coho salmon, cutthroat trout and steelhead. The creek is a Goal 5 Significant Natural Resource Area under Oregon Statewide Planning Goals. As such, the stream needs to be protected and managed at a level adequate for fish, wildlife, pollution abatement, recreation, aesthetics and agriculture.

Rooftops and asphalt in Oregon City's Hilltop and Berry Hill areas speed up how fast rainfall flows to Newell Creek. This changes the natural stream flow and can adversely affect all stages of fish life, particularly juveniles which can be swept downstream during high flows. In addition, stream banks can be scoured resulting in unstable slopes.

Oregon City's objectives for the project included:

- Protect Newell Canyon from the project stormwater runoff;
- Reduce adverse stormwater impacts from the existing Berry Hill Shopping Center; and
- Restore fish passage to the area upstream of Highway 213.

In order to provide stormwater treatment and detention Oregon City needed a stormwater management facility within the project area that would be capable of managing the target stormwater flows. This included slowing the runoff and treating the water to remove pollutants found in stormwater. The project team found a site that consisted of three properties where the owners were willing to sell and move from busy Beavercreek Road.



The project team then designed a pond to treat nearly 7.5 acres of impervious surfaces, far surpassing the 2.2-acres created by the project. Stormwater runoff from a large portion of the Berryhill Shopping Center and Beaver Creek Road will be routed to a pond. The facility was designed to detain flows as soon as it starts raining and continue to reduce peak flows to Newell Creek during all rainfall events from the 2-year to the 100-year storms. The stormwater discharge will be regulated using an orifice and riser sized to reduce peak flows.

Water quality treatment is provided through a wetpond facility, which allows 90-95% of all rainfall events to settle out sediment and contaminants before discharging to Newell Creek. The city's minimum requirement is to provide water quality treatment for 50% of the water quality design flow. The water quality standard design flow is calculated as 1/3 of the 2-year storm event, but this pond was designed to provide treatment for the entire water quality event.

A licensed landscape architect prepared landscape plans to facilitate the water quality and detention aspects of the pond. The plan was designed to make the pond aesthetically pleasing and functional. A temporary irrigation system will be installed to establish the new plants. A small island will be constructed to provide refuge for wildlife.

During extended rainfall events water will be present in the pond. As a safety measure, a vinyl coated chain link fence will be constructed around the perimeter of the pond.

The City's third objective pertaining to fish passage restoration was found to be unworthy at this site. Instead, the City achieved this objective by working with Clackamas County and the US and State Departments of Fish and Wildlife to construct an "in lieu of" project with far greater benefits at another site off of Redland Road. A culvert on Holcomb Creek, in the Abernethy Creek watershed, was replaced to open up fish passage to 0.7 miles of creek with the potential for 7 miles total with future projects.

**PRIOR TO CONSTRUCTION**  
***Holcomb Creek Culvert Replacement Project***  
**2002—2003**



From culvert inlet opening,  
looking downstream through  
the 6'x 6' concrete box culvert

Looking downstream through  
6'x 6' concrete box culvert  
Outlet perched over 1.5',  
creating fish passage barrier.  
Downstream weirs in  
background.



Looking upstream (culvert at right edge  
of photo) series of downstream weirs

**POST CONSTRUCTION**  
***Holcomb Creek Culvert Replacement Project***  
***FALL 2003***



From culvert inlet opening, looking downstream through the multi-plate arched culvert. Culvert is embedded 2 feet below thalweg with native material and fish habitat rocks.

From culvert outlet, looking upstream through the multi-plate arched culvert. Downstream weirs are removed and channel re-graded.



Culvert outlet view from road surface

**DURING CONSTRUCTION**  
***Holcomb Creek Culvert Replacement Project***  
**SUMMER 2003**



**Fish Salvage Results: July 31 to August 1, 2003**

| <b>Species</b>                                  | <b>Upstream of Culvert</b> | <b>Downstream of Culvert</b> |
|-------------------------------------------------|----------------------------|------------------------------|
| Coho salmon – juvenile                          | 0                          | 47                           |
| Cutthroat trout                                 | 5                          | 8                            |
| Salmonid (unidentified) – juvenile <sup>1</sup> | 1                          |                              |
| Pacific lamprey – adult                         | 0                          | 3                            |
| Pacific lamprey – juvenile                      | 0                          | 12                           |
| Western brook lamprey – juvenile                | 3                          | 9                            |
| Redside shiner                                  | 0                          | 1                            |
| Sculpin (Cottus sp.)                            | 20                         | 127                          |
| Crayfish                                        | 1                          | 39                           |
| Pacific giant salamander                        | 1                          | 0                            |
| Frog - unidentified (not red legged)            | 0                          | 1                            |

<sup>1</sup> Unable to accurately identify due to small size (approx. 1 inch).

Assembling Multi-plate Arch culvert while stream is being diverted following fish salvaging operation.

