



HIGH AND DRY

The Calistoga Setback Levee offers a welcome refuge to a flood-ravaged community

IRWA's 2015 Project of the Year

BY BARBARA BILLITZER

Orting is a small city located about 30 miles from the base of Mount Rainier in Washington State. The town sits in a fertile valley nestled between the Carbon and Puyallup Rivers and is known for its beautiful parks and historic buildings. With a healthy run of salmon, it attracts fishermen from far and wide. And despite the heavy rainfall, on a clear day, the scenic views of Mount Rainier are spectacular.

Orting has experienced more than its fair share of flooding over the years. Since 1990, there have been seven federally declared flooding disasters. In the 1930s and 1960s, levees were built along both the Carbon and Puyallup Rivers to protect Orting against flooding. But as floods grew bigger and more

frequent, much of the aging infrastructure no longer offered the level of protection needed.

Finally, during a major flood in 2006, the Puyallup River levee was overtopped, and water ran through nearby housing developments, impacting hundreds of homes, schools and businesses. In 2009, flooding forced the largest urban evacuation in state history, sending 30,000 residents fleeing and threatening operations at Washington's Port of Tacoma, as well as the Tacoma wastewater system. According to a county flood control district report, the damages had exceeded \$725 million over the years. To protect the city from future floods, a long-term solution was crucial. And that's what the Calistoga Setback Levee accomplished.



In Search of Long-Term Options

One of the flood prevention methods previously used by the city was dredging the Puyallup River to remove rocks and silt washed down from Mount Rainier. In the past, this worked to increase the capacity of the river. Unfortunately, by 2006, this was no longer legally possible because of the Endangered Species Act, which protects certain native fish populations. It took a comprehensive and lengthy outreach program to help the community overcome the long entrenched mindset that dredging was the only option.

An additional problem was that the existing levee severely limited the river channel and the floodplains from functioning properly. When the Federal Emergency Management Agency (FEMA) declared its intention to not recognize old levees as any kind of protection, roughly half the homes in Orting were suddenly required to pay up to \$2,500 a year for lender-required flood insurance. To adequately protect the city, a 1.6-mile long setback levee was proposed that would widen the Puyallup River. It would also reconnect 46 acres of floodplain and 55 acres of backwater and streambed for salmon habitat restoration.

Following decades of flooding disasters, the new levee has protected the city from storm flooding, while creating other significant benefits for the community.



In 2006, when the Puyallup River in Washington State flooded, emergency responders deployed swiftwater rescue teams, boats and even helicopters to rescue people from the rising water.



Sand bags were stacked along the Puyallup River when the 2009 flood threatened adjacent mobile home park residents.

Meeting the Challenges

Mark Bethune, Orting's Chief Administrative Officer, was called on to develop a viable plan. "After the major flood in 2006, Mayor Cheryl Temple directed me to come up with solutions to address the flooding," said Mark. "To test the feasibility of building a new setback levee, I teamed up with the city's building official to evaluate potential options. After visiting with our various state and federal legislators to see what kind of funding might be available, we learned that any large project like this needed to meet the needs of conservationists and environmentalists. Ultimately, we determined that not only would a new levee be required, but it would need to improve the salmon habitat as well. The expense would be beyond the city's ability to cover. So our council recommended a significant increase in the citizens monthly stormwater rate to help build up funding."

During the planning stages, a sediment transport study was completed to project where the bottom of the river would be in 15 to 30 years. This information was used to determine how high the levee needed to be. The levee was designed based on projected 2026 levels with an additional three feet of protection added. The wider channel would provide the area needed for the river to spread out, while lessening the flooding impacts and damages to downstream cities that were also severely impacted during previous floods.

To guide the development of a Flood Protection Plan, a Project Advisory Committee was formed with representatives from the city, the school district, Pierce County, Puyallup Tribes, the Department of Ecology, the Department of Fish and Wildlife, and the city's consulting planners. Working collaboratively with all stakeholders and regulatory agencies, the city was able to successfully facilitate the necessary project approvals.



Widening the river channel for 1.6 miles and building a new levee, the city anticipates a direct benefit to the local economy that should exceed \$1 million annually.

Finding the Money

The setback levee was projected to cost \$19 million. Where would a small city, with an even smaller general fund of only \$2.5 million per year, get that kind of money?

Ken Wolfe, the Building Official for the City of Orting, had invested significant time on the levee project and was determined to make it a success. After working with Mark and visiting with state and federal legislators, Ken joined with several funding groups and committees, while working with permitting agencies to develop trust and support for the project. He became actively involved with the Pierce County Flood Control Zone District and with the Salmon Recovery Funding Board, which provides grants to protect or restore salmon habitat.

"Initially, the citizens of Orting made a financial commitment by agreeing to pay the highest stormwater rates in the region. Since this was a regional issue, the city was able to secure funding by collaborating with a half dozen different agencies. Over time, the city government would fund the project's design, wetland mitigation, and grant matching with its own funds," said Ken.

The Washington State Legislature recognized the need to be smart about floodplain restoration and appropriated \$50 million for the Coordinated Investment in Puget Sound Floodplains project sponsored by The Nature Conservancy,



To dewater the site and create a sound structural base for the new levee, over 1,100 interconnected wells were used to continuously pump water out of the ground.

the Puget Sound Partnership, and many local and regional partners. The Calistoga Setback Levee is one of nine groundbreaking flood-risk and restoration projects in the floodplains of Puget Sound's major rivers that are receiving some of their funding through this initiative.

Initially, the city received \$540,000 from the Salmon Recovery Funding Board for property acquisition and design, which got the project shovel ready pending the availability of other funding. The city continued working aggressively to secure the rest of the funding which included:

The City of Orting	\$2.0 million
Pierce County Flood Control Zone District	\$8.8 million
Salmon Recovery Funding Board	\$2.2 million
Washington State Department of Ecology	\$1.3 million
Nature Conservancy Floodplains Grant	\$4.7 million

The total construction cost of the levee project was \$18.6 million. Considering that the Pierce County Flood Control District collects approximately \$10 million each year, committing \$8.8 million to this project demonstrated its vital importance, not just for Orting, but also for the other downstream communities impacted by flooding.

In addressing potential risks and opportunities, the city decided to accelerate the process of dewatering the construction site. This allowed the contractor to build the levee faster, in preparation for the upcoming winter rainy season. More than 1,100 interconnected small dewatering wells continuously pumped water out of the ground. A site was leased on a month-to-month basis for construction staging.

Collaborating with the Community

This project had tremendous community support from the beginning. The team was proactive in sharing information with the community, other cities and special interest groups, as well as engineering students from local schools. The city took every opportunity to share information about the

project at environmental group meetings, conferences, and regional/local community events like Orting's Annual Emergency Preparedness Fair.

A Project Engineer with Parametrix, J.C. Hungerford, PE served as the Project Manager and was the liaison between the city staff and the consultant team from the earliest days of the project through its construction completion. He also assisted in seeking out grant funding for the project.

A firm believer in the vital role of communications, J.C. said, "On a project of this scale with regional significance, it is important to involve all of the stakeholders early and stay in constant communication with them. That way, when something is needed, it does not come as a surprise and things can move along quickly. By maintaining an environment of collaboration, the team would identify issues weeks ahead of time, allowing everyone to work together to reach a solution before the issue delayed construction."

The Puyallup Tribe was a huge supporter throughout this entire project. As a federally recognized tribe, they remain deeply involved in fishing. In fact, it constitutes such an important part of their culture that it is surrounded by ritual and spirituality. The city made sure it always had tribe representatives at the appropriate planning and budget meetings.

During construction, the city hosted a number of on-site tours with federal, state, and county representatives, the Nature Conservancy, other city jurisdictions, Native American tribes and students. Local schools and colleges are now using the project as a real-life example to teach students about floodplains, levees, habitat, vegetation, log jams, wildlife and stormwater management.



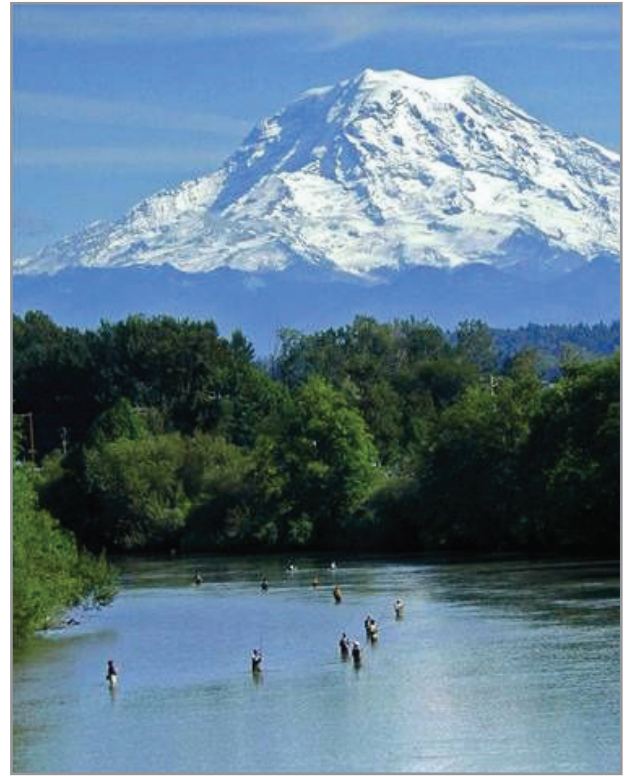
The project team, from left, Parametrix Project Manager J.C. Hungerford, previous Mayor of Orting Cheryl Temple, current Mayor Joachim (Joe) Pestinger, SR/WA, Orting's Building Official Ken Wolfe and Orting's Chief Administrative Officer, Mark Bethune. Photo by Kevin McGowan, McGowan Photography.

Protection at Last

In November 2014, the new levee was put to the ultimate test when the fourth highest flow since 1962 came rushing down the Puyallup River. Prior to constructing the new levee, this would have flooded portions of Orting and triggered substantial evacuations. As expected, the new levee performed extremely well. There were no evacuations and not a single sand bag had to be filled. Two additional high flows occurred during the 2014-2015 winter season, but again, the new levee protected the city from flooding.

The city will obtain FEMA certification for the new levee and remap the entire area through the FEMA Levee Analysis and Mapping Approach program. The goal is to remove portions of the city from the FEMA floodplain, thus removing or reducing flood insurance requirements from affected parcels. Once the levee is FEMA certified, approximately 1,100 homes will potentially be removed from the 100-year floodplain, eliminating the requirement that homeowners carry flood insurance, or they will be able to acquire it at a much lower cost. The increased protection will save property owners on average \$900 to \$1,300 per year in insurance premiums.

In addition to reducing the annual insurance premiums for residents, the project has brought other economic benefits as well. Businesses that were previously forced to close due to flood damage are now protected and can remain open. It is anticipated that the direct benefit to the local economy will exceed \$1 million annually.



Against a scenic Mount Rainier backdrop, over 830,000 salmon are expected to return to the Puyallup River over the coming year.



Carefully designed logjams were built to create habitat for chinook salmon, bull trout and steelhead trout. The project is already paying dividends, as the levee has survived several major storms, keeping the city and its residents protected.

“ There is a brotherhood amongst the people of surface water management and these communities.”

While providing significant flood protection, the levee has also restored and enhanced the natural habitat and provides the community with recreational and educational opportunities. The project reconnects 46 acres of floodplain to the Puyallup River, restoring natural riverine processes and creating off-channel habitat for salmon. Additionally, 55 acres of side stream habitat has been reconnected through a series of fish passable culverts and log structures. All invasive plant species were removed and replaced with more than 60,000 native plantings. Approximately \$2.2 million in engineered log jams and large woody debris structures and islands from the old levee were left in strategic positions in order to promote channel braiding, a way to manage velocity.

Sharing Best Practices

Cheryl Temple, Orting's Mayor when the project began in 2006, played an instrumental role in ensuring the city got the level of protection it deserved. "It took seven years of hard and determined work to make this project feasible. But it was the city's perseverance that led to the project's ultimate success," she said.

When asked about the greatest lesson learned from the project, Cheryl said, "Don't ever give up. Everyone showed their willingness to help, and little by little, it snowballed. That snowball took years to build, but it grew nonetheless. It seems like success bred success, and we kept building on that."

In 2014, Joachim (Joe) Pestinger, SR/WA became the Mayor of Orting. Having retired from the Washington State Department of Transportation, Joe spent eight years serving on the city council and on the fire commission. His extensive involvement during that time helped to garner trust among all the stakeholders and agencies, and facilitated the process of securing funding and approvals for the project. Joe believes his main role was to support the team and help remove obstacles.

"I like to tell people that I get to bask in the glory of the hard work of others," said Joe. "Any recognition for a job well done is greatly appreciated, especially at times when government is facing so many challenges. Winning the Project of the Year Award was a great morale booster for all of us."



"Success," boasted Orting's top building official Ken Wolfe. In November 2014, Ken celebrated the day after his 8,100-foot levee withstood serious flood waters. "For this being the fourth largest flood since 1962, we didn't fill one sandbag."

A Safer Future

The Calistoga Setback Levee is the largest levee project in Pierce County since the late 1960s, when most of the original levees were built. It allows the Puyallup River to spread out and creates open land that can absorb floodwaters so that the river is less likely to overflow and flood the town. It has become a model project for other communities throughout the region who have older levees in need of replacement or river channels that need widening. Several local jurisdictions have already met with Orting to learn how they can develop their projects successfully. The city has also been contacted by other states seeking information for their own projects.

"There is a brotherhood amongst the people of surface water management and these communities. We're all working for the same objectives—to protect our communities and enhance our environment," said Ken.

While this project is a wonderful example of widening a river channel, restoring habitat, levee construction, and reconnecting floodplains, perhaps the greatest lessons to be learned are diligence in seeking grants, partnerships, as well as collaboration with stakeholders, tribes and agencies to ensure a project's success. Through vision, perseverance and roll-up-your-sleeves hard work, the City of Orting has successfully created a more resilient community. And that benefits everyone. ✪