

Chehalis River Basin

The Chehalis River Basin in southwestern Washington drains about 2,170 square miles. The basin includes most of Grays Harbor, large parts of Lewis and Thurston Counties, and limited areas in Pacific, Cowlitz, Mason, Wahkiakum, and Jefferson Counties. Higher elevations in the basin are rugged and densely forested, but near the city of Chehalis the river emerges onto a fertile plain and meanders until emptying into eastern Grays Harbor. Grays Harbor, 45 miles north of the Columbia River mouth, is the estuary of the Chehalis, Hoquiam, and Humptulips Rivers. The harbor is 13 miles long, east and west, and roughly pear-shaped. It is separated from the Pacific Ocean by two low, sandy peninsulas, one-half to two miles wide, which are being developed as vacation and fishing resorts. The harbor contains many mud flats, exposed at low tide, and several channels. Most important are the North and South Channels, extending from the Chehalis River to deep water at the harbor entrance. The tributary area above the lowlands bordering Grays Harbor varies from rolling uplands and fertile river valleys of Willapa Hills to the south and east, to dense foothills of the Olympic Mountains to the north. Industrial development includes lumbering and wood products manufacturing, petroleum in domestic and foreign trade, and fishing and fish processing. Other important industries are agriculture and recreation.

Hoquiam River

Completed Navigation Project (Seattle District) The Hoquiam River empties into Grays Harbor at the city of Hoquiam. The project, completed in 1933, consists of a navigation channel dredged to 18 feet deep and 100 feet wide from the river mouth upstream to its junction with the East Fork. Federal costs for the project have been \$51,294 for construction and \$5,316 for maintenance. The project is operated in conjunction with the Grays Harbor and Chehalis River Project. Commerce in 1997 totaled 13,000 tons.

Wynoochee Dam and Lake

Completed Water Supply and Flood Control Project (Seattle District) The 177-foot-high, 672-foot-long concrete gravity dam, connected to the abutment by earthfill sections, was constructed at river mile 51.8. The dam creates a 4.4-mile-long lake with a storage capacity of 70,000 acre-feet. The project is operated mainly for water supply and provides flood control and water for recreation, irrigation, and fisheries enhancement. The city of Aberdeen agreed to pay all costs allocated to water supply, about 78 percent of joint project (i.e., features which serve all project purposes) costs. Original construction cost was \$23,392,245. Cost of recreation facilities was \$102,200. Before title transfer, \$17,043,670 was expended for maintenance. Construction on the project began in August 1969 and was completed in 1974. The project began operating in

December 1972. The project is entirely within the Olympic National Forest. Recreation facilities along the lake and on adjacent project lands are being developed by the Forest Service. Coho Campground provides camping and boat launching facilities, and Chetwoot Campground is a walk-in area for backpackers. Day-use facilities and a visitors center are at the dam. Wynoochee Lake Shore National Recreation Trail was dedicated in 1979. The 10-mile trail loops around the lake, crosses the dam, and is maintained by the U.S. Forest Service. Fish mitigation measures include a small barrier dam and fish collection facility two miles below the dam. Fish migrating upstream are collected here and trucked to a release point above the dam. Downstream migrants pass through the dam by means of pressure-controlled multi-level pipes. To replace wildlife habitat lost when the lake was formed, 1,024 acres of grazing lands below the dam are managed for elk and deer. About 250 acres are farmed. Each year, about a quarter of the 250 acres is plowed and reseeded so rotated forage crops can be raised. In 1987, the cities of Tacoma and Aberdeen received a Federal Energy Regulatory Commission (FERC) license to install a hydropower facility at the Wynoochee project. Construction of the 10 megawatts hydropower plant started in 1991 and became operational in 1993. The Water Resources Development Act of 1990 authorized the transfer of fee title of the project from the Corps of Engineers to the city of Aberdeen. Title was transferred in October 1993. Flood damages prevented through September 1998 are \$4,298,000.

Wynoochee Dam

Section 1135 Fish Restoration Project The Seattle District is conducting a Section 1135 Study to investigate methods of restoring the coho and steelhead fish runs in the Wynoochee River to pre-project historical levels. Studies in the 1980's showed that 13 percent of the coho and 25 percent of the steelhead smolts that pass through the projects during their downstream migration are killed. The Proposed Section 1135 project would significantly reduce this loss in three steps. First, improved fish passage would be gained through the new hydropower intake structure, where an Eicher fish screen would move the juvenile fish out of the penstock into a pipe for transportation into the Wynoochee River downstream of the project. The second step would include increasing the river flows by increased releases from the project in the spring and summer months to assist in the downstream migration of fish and help enhance the habitat in the lower 52 miles of the Wynoochee River. The third step would be the construction of rearing facilities just downstream of the project. These rearing ponds would be used to acclimatize coho and steelhead smolts before their release into the Wynoochee River. The combination of these three steps should restore the fish runs to pre-project condition.

Chehalis River and Tributaries

Feasibility Studies (Seattle District) The Chehalis River and Tributaries

Feasibility Study was underway from 1946 to 1949 and 1966 to 1992. Initial effort focused on investigating major multiple-purpose storage projects in the upper basin, none of which were found to be economically justified, except for Wynoochee Dam. In 1971, the basin study was divided into the four interim studies whose descriptions immediately follow. In 1998, Congress requested that the Corps review past report recommendations particularly regarding potential non-structural measures and environmental restoration opportunities. Work on a reconnaissance report will begin when funding is provided.

Wynoochee Hydropower/Fish Hatchery Study

Interim Feasibility Study, Deferred (Seattle District) An interim study was initiated in 1980 to determine feasibility of adding hydroelectric power generation and fish enhancement to Wynoochee Dam Project. The study was completed in September 1982. The final feasibility report and environmental impact statement recommended addition of an 11.3 megawatt hydropower plant at Wynoochee Dam and a 405,000-pound enhancement fish hatchery for salmon and steelhead 3,000 feet downstream of the dam. The report has been returned without action and further Corps studies have been deferred because Aberdeen and Tacoma built a power generation plant under the Federal Energy Regulatory Commission process. The dam ownership was transferred to Aberdeen.

Chehalis River at South Aberdeen and Cosmopolis

Completed Flood Control Project (Seattle District) The south side of the Chehalis River near its mouth in the cities of Aberdeen and Cosmopolis suffers flood damages from river discharges during extreme high tides in Grays Harbor. An interim feasibility report and environmental impact statement under the Chehalis River and Tributaries study was completed in 1975 and submitted to Congress in 1978 for authorization of a levee project. A 4.2 mile long levee system protecting south Aberdeen and Cosmopolis was authorized by the Water Resources Development Act of 1986 with an estimated cost of \$22.4 million.

Preconstruction Engineering and Design studies were begun in October 1983. These design studies refined the project design resulting in a plan for construction of a 4.2-mile-long levee system to protect 1,176 acres from the standard project flood. A General Design Memorandum and Environmental Impact Statement supplement were approved in October 1990. Plans and Specifications were completed in 1994, following approval in November 1991 of a bond issue by Aberdeen voters to fund the non-federal share of project costs. The Project Cooperation Agreement was signed with Aberdeen on March 1, 1994. Land acquisition was completed by the local sponsor in January 1995. The construction contract was awarded in March 1995 with project completion in December 1996. The project uses fish-friendly tide gates that provide necessary flood control while greatly increasing the time during the tidal cycle that fish can access sloughs and creeks in the protected area. The project is expected to cost

\$11 million, of which one-fourth was provided by the local sponsor. Completed in 1998 with a total of \$8,277,007 in federal funds and \$1,552,619 in non-federal funds.

Centralia Flood Damage Reduction Project

Completed Flood Control Feasibility Study (Seattle District), Preconstruction Engineering and Design, Underway Small Flood Control Study, Deferred The Centralia-Chehalis area suffers flood damages caused by high flow from the Chehalis, Newaukeum, and Skookumchuck Rivers. An interim feasibility report under the Chehalis River and Tributaries study, completed in 1982, proposed modification of the privately owned Skookumchuck Dam to provide flood control storage during winter months. The plan would have involved changing operational procedures for the dam and included structural modifications. The project was authorized by the Water Resources Development Act of 1986. Resumed in 1998. Total costs through September, 1998 are \$1,560,193. Seattle District initiated PED studies in February 1988. In 1990, these studies determined that the project lacked economic viability and there was no federal interest in pursuing the dam modification. A reconnaissance study identified two feasible levees in Centralia and potential non-structural measures. A report was completed recommending deauthorization of the dam modification project and initiation of a feasibility study through the small project program. The hydrologic and hydraulic data developed during PED was provided to local governments for their use in administering flood plain regulations. In 1991, Centralia decided not to pursue the levee feasibility study at that time. However, the severe 1996 flood rekindled interest in flood damage reduction in the Centralia-Chehalis area. Local citizens and business interests formed a Flood Action Council that reviewed past plans and reconsidered an expanded project that combined dam modification with additional measures in the flood plain. In 1997, Lewis County formed a Flood Control Zone and funded further development of this locally preferred plan, producing a reconnaissance level report that identified a potentially economically feasible plan. In July 1998, Lewis County requested that the Corps resume work und PED to further evaluate flood damage reduction measures for the Centralia-Chehalis area. PED is currently underway.

Aberdeen-Hoquiam Flood Damage Reduction Study

Interim Flood Control Feasibility Study, Deferred (Seattle District) The north side of the Chehalis River at its mouth in the cities of Aberdeen and Hoquiam also suffers flood damages from high Chehalis, Wishkah, and Hoquiam River discharges in combination with high tides in Grays Harbor. The interim study under the Chehalis River and Tributaries study evaluated potential flood damage reduction measures for Aberdeen and Hoquiam. The reconnaissance report determined that further consideration of a partial levee system was worthy of further study. This study was deferred in 1988 at the request of the local

sponsors.

Salzer Creek Flood Damage Reduction Study

Small Flood Control Study, Terminated (Seattle District) Lower Salzer Creek flows through sections of Centralia, Chehalis, and unincorporated Lewis County. During flooding, the creek causes damage to both cities and the county. At the request of Centralia, the Corps began a Section 205 study of the lower creek basin in 1988. Reconnaissance studies were completed in 1990, indicating that a pump plant and other improvements were worthy of further investigation feasibility studies. The city signed the Feasibility Cost Sharing Agreement in September 1990. The study was terminated May 1993 following failure of the city to provide cost sharing funds.

Long Road Diking District Flood Damage Reduction Study

Section 205 Small Flood Control Study, Completed (Seattle District) The Lewis County Flood Control District No. 2 (Long Road Diking District) is located on the north banks of Salzer Creek east of Interstate Highway 5. Following the termination of the Salzer Creek Study in 1993, the Long Road Diking District requested a Section 205 study of just their portion of the much larger Salzer Creek area. Reconnaissance studies were completed in 1994 that indicated levee improvements were worthy of further study. A Feasibility Cost Sharing Agreement was prepared between the District and the Corps and feasibility studies began in May 1995. Feasibility studies were completed in December 1998, and a 2,200 foot long levee that would provide protection up to the 45-year flood was recommended. The plans and specifications phase began in February 1999. Construction is estimated to begin in October 1999 and end one month later. The total project cost (including real estate, plans, and specs) is estimated at \$544,000.

Centralia-Chehalis Flood Warning and Flood Response Project

Completed Small Flood Control Study, (Seattle District) As a response to the disastrous flooding in January 1990 in the Centralia-Chehalis area, Lewis County requested aid in improving its existing flood warning and flood response system. The study, conducted under Section 205 authority, was completed in 1993, and produced several useful products, e.g., a public flood brochure, a 4-phase flood warning map, a flood video, and a plan for a detailed flood fight manual. The products are being used to make the public and elected officials more aware of flooding problems. No construction deemed necessary. Total cost, \$41,000.

Grays Harbor and Chehalis River Navigation Project

Completed Navigation Project (Seattle District) Corps of Engineers navigation improvements work in Grays Harbor consists of several projects. A 46-foot

deep-draft channel across the bar is secured by a south jetty 13,734 feet long and a north jetty 17,200 feet long. Further improvements include a channel 36 feet deep (from deep water in Grays Harbor, 19 miles to Aberdeen, and 30 feet deep to Cosmopolis) and construction of ship turning basins at Aberdeen (36 feet) and Cosmopolis (30 feet). Other aspects of the project are shore protection for Point Chehalis, Westhaven Cove small-boat basin at Westport, and mitigation of channel improvements conducted in 1990 and 1991. Improvements of the Chehalis River navigation channel from the ocean to Cow Point were completed in February 1991, at a cost of \$11.2 million. The completed portions of the project (16-foot channel from Cosmopolis to Montesano and the 14-foot channel in South Bay to Bay City) were deauthorized Jan. 1, 1990 under provisions of Public Law 99-662. Cost of the existing project through September 1998 was \$22,303,414 federal funds for construction work and \$144,002,765 for maintenance and rehabilitation. In addition, \$6,078,439 in contributed funds have been expended for construction and maintenance. Commerce totaled 1,486,000 tons in 1997. Recreational cost-sharing with the Port of Grays Harbor has resulted in construction of a tower overlook, low level overlook with handicap ramp access, and parking facilities at the town of Westport.

Grays Harbor, Chehalis River, and Hoquiam Rivers

Completed Navigation Feasibility Study Preconstruction Engineering and Design Navigation Studies, Completed Construction Completed (Seattle District) Feasibility studies, which were completed in 1982, recommended widening and deepening of the navigation channel from the outer bar, through the entrance to Grays Harbor and the estuary and up the Chehalis River past Aberdeen. Modification of the railroad bridge at Aberdeen was also recommended. The recommended project widens and deepens 23.5 miles of existing project from the ocean bar to just upstream of Aberdeen. The project is widened to 350 feet (250 feet for the last 2.3 miles) and deepened to 36 feet (30 feet in the last 0.7 mile). Turning basins at Cow Point and Elliott Slough are expanded and local ship berths are deepened. The swing span and two inner piers of the Union Pacific Railroad bridge at Aberdeen are replaced with a high lift span. Additional features of the project include relocation of existing navigational aids and underwater utilities, addition of new navigational aids, and creation of new habitat to mitigate fish and crab losses due to the project. The project is in the plans and specifications stage with the general design memorandum being completed in 1989. Total federal funds expended through September 1998 were \$17,183,453; contributed, \$6,078,439. The project is estimated to cost \$70 million, \$24.6 million of which is the non-federal share provided by the local sponsor. The project was authorized by the Water Resources Development Act of 1986. Commerce in 1997 totaled 1,486,000 tons.

Westhaven Cove (Westport Marina)

Completed Section 107 Navigation Project (Seattle District) Under Section 107 the original marina was expanded by modifying the existing breakwater and adding a new south entrance. Construction was completed in December 1979 at a cost of \$2 million. Contributed funds expended totaled \$1,230,035.

Westhaven State Park, Grays Harbor

Completed Beach Erosion Study (Seattle District) Studies conducted in 1974-76 were made on erosion protection for the park. A negative project resulted because costs of beach protection are much greater than the benefits.

Point Chehalis Beach Nourishment

Completed Shore Protection Project, Section 111 (Seattle District) Shoreline erosion has been occurring along the Point Chehalis shoreline for a number of years. The Point Chehalis Erosion Protection Project was authorized in 1948 and constructed in 1954. Shoreline erosion threatening Westport's Sewage Treatment plant and outfall line necessitated a study of the problem. Studies were conducted at the request of the city of Westport, local sponsor, and accomplished under the authority of Section 111 of the Rivers and Harbors Act of 1968. Studies indicate that the South Jetty, part of the federal navigation project, is contributing to the erosion problem. Various alternatives were evaluated and beach nourishment with periodic renourishment over a 10-year period was selected as the recommended plan. Approximately 300,000 cubic yards of maintenance dredging has been placed on the beach to control erosion. Construction was completed in December 1995. Costs through September 1998, \$1,404,988. Mitigation contract was completed in 1998. Under current cost sharing requirements, the local sponsor (city of Westport) is responsible for operation and maintenance of the work after year 10. A Project Cooperation Agreement was executed on September 1, 1995.

Ocean Shores Channel Improvement Project

Completed Small Navigation Study (Seattle District) Reconnaissance level studies were completed in 1979 on a channel improvement project to the small-boat basin at Ocean Shores. A negative report was submitted in September 1979.

Long-Term Maintenance of the South Jetty

Completed Operation and Maintenance Study (Seattle District) Distinct and persistent erosion of the shoreline at the landward end of the South Jetty at the entrance of Grays Harbor, resulted in the formation of a breach between the South Jetty and the adjacent South Beach shoreline during a moderate winter storm on December 10, 1993. The Corps filled the breach in fall 1994, and was directed to conduct a comprehensive study to determine the most appropriate long-term solution. Detailed engineering studies were completed in June 1997.

including an examination of how the existing deep draft navigation project has contributed to the overall shoreline erosion problems. By memorandum dated February 11, 1998, the Acting Assistant Secretary of the Army directed Operations and Maintenance (O&M) authority. Funds to implement the approved plan were added by Congress to the FY 1998 and FY 1999 project O&M budgets. A contract for a 1,900-foot extension of the Point Chehalis revetment extension was awarded in October 1998 and construction was completed in March 1999. Construction is expected to begin in late summer 1999 on measures to reinforce the inner end of the South Jetty and to extend the life of the breach fill.

Shoalwater Bay Shoreline Erosion

Study and project authorized by Section 545 of the Water Resources Development Act (WRDA) of 2000 (Seattle District) A study to determine the most appropriate long term solution to reduce shoreline erosion and flood damage due to coastal storms affecting the Shoalwater Bay Indian Reservation is underway and will be completed in late 2006. The Reservation is located on the north shore of Willapa Bay in Pacific County. The Seattle District has completed a comprehensive investigation of the coastal processes affecting the Reservation, and has formulated and evaluated alternative plans. The most appropriate long-term solution to identified problems is to restore the severely eroded barrier sand dune located on Graveyard Spit, and to extend an existing riprap flood berm along the shoreline. A formal public review will be conducted in fall 2006, followed by approval of the project for construction by the Assistant Secretary of the Army (Civil Works). Construction of the shoreline flood berm extension is expected to begin in early 2007. The project will be constructed and maintained at full federal expense.

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