

WEDA Environmental Excellence Award Application
Columbia River Channel Improvements Project (CRCIP)



Owner of Project: US Army Corps of Engineers
Nominating Entity: Pacific Northwest Waterways Association (PNWA)

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Nominating Entity

Pacific Northwest Waterways Association (PNWA)
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Project Owner

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Team Members

Laura Hicks, Corps, Portland District
Doris McKillip, Corps, Portland District – **WEDA Member**
Mark Dasso, Corps, Portland District
Kim Larson, Corps, Portland District
Marci Johnson, Corps, Portland District
Steve Bartell, E2 Consulting Engineers, Inc.
Paula Ehlers, Washington Department of Ecology
Loree' Randall, Washington Department of Ecology
Perry Lund, Washington Department of Ecology
Agnes Lut, Oregon Department of Environmental Quality
Greg Smith, U.S. Fish and Wildlife
Kathy Roberts, U.S. Fish and Wildlife
Kathy Tortorici, National Marine Fisheries Service
Robert Anderson, National Marine Fisheries Service
Dale Blanton, Oregon Department of Land Conservation and Development
Dianne Perry, 6 Sponsor Ports
Christine Valentine, Oregon Department of Fish and Wildlife
Patty Snow, Oregon Department of Fish and Wildlife

Role of Team Members

The role of each team member was to represent their individual agency and as Adaptive Management Team members, work cooperatively together to advance the CRCIP project and ensure that environmental risks were assessed.

WEDA Status

Team member Doris McKillip is a WEDA member. Many WEDA member companies were also employed throughout the CRCIP, including Great Lakes Dredge & Dock, JE McAmis, and The Dutra Group.

Background

The lower Columbia River navigation channel has been dredged to ensure the safe passage of cargo ships for more than 100 years. In 1989, the Columbia River Channel Improvements Project (CRCIP) began, to handle the new generation of larger, deep draft vessels when they are fully loaded. The project was completed in November 2010. 103 river miles from the Mouth of the Columbia River (MCR) to the Portland/Vancouver area were deepened from 40 to 43 feet (Figure 1). The US Army Corps of Engineers (Corps) project was jointly sponsored by the ports of Portland and St. Helens, Oregon, and the ports of Longview, Kalama, Woodland and Vancouver, Washington. The CRCIP continues to provide a great many environmental and economic benefits for the Northwest and the nation.

Environmental Benefits: Achievements Lasting Well Into the Future

Deepening the Columbia River was an environmental achievement more than 20 years in the making. The authority to perform a one year study of the project was granted in 1988, and the study began in 1989. This phase quickly moved to a \$6.1 million cost-shared feasibility study between the US Army Corps of Engineers (Corps) and the 6 Lower Columbia River (LCR) Ports. This feasibility study was completed in August 1999 and construction was authorized by Congress in December 1999.

In 2000, challenges to the CRCIP arose. National Marine Fisheries Service (NMFS) withdrew their Biological Opinion (BO) for the project and both Oregon and Washington Governors denied the water quality certifications. The project was civilly and/or legally challenged before the Washington Water Pollution Control Board over water quality concerns, District Court over the Corps Environmental Impact Statement (EIS) and the NMFS BO (NMFS BO was ultimately dropped), and by the Webb Diking District over construction of a mitigation site within their district.

In response, the Corps drafted a Supplemental EIS (SEIS) and convened an independent expert panel. This panel addressed the environmental issues raised in relation to the Project's potential impact on endangered salmonids. In their research, the panel did not find reason to believe that the deepening would impact listed species; however, they cautioned that care and monitoring should be put in place to assure that nothing was missed as the project moved forward. In May 2002, both NMFS and US Fish and Wildlife Service (USFWS) determined that the Project could proceed without jeopardizing listed species. The Corps completed the SEIS and reapplied for water quality certification in Oregon, Washington, and with Coastal Zone Management Consistency. To meet federal and state clearances for this project (2 BOs, 2 water quality certifications and 2 coastal zone consistency determinations) it was required that an Adaptive Management Team (AMT) be established and numerous criteria be monitored before, during and after construction.

To comply with these clearances, the federal and state resource agencies formed an AMT and began writing the framework to the Adaptive Environmental Management (AEM) Program. The AMT's role was to assure the deepening did not cause any unforeseen impacts to the environment. Figure 2 (Page 8) displays a Flow chart describing the proposed AEM Process in support of the Channel Improvement Project.

The unique approach to implementing the CRCIP using a formal AEM produced several important environmental benefits. The principal direct benefit was a reduction in risks to evolutionary significant units (salmon) protected by the Endangered Species Act. Critical juvenile salmon habitat factors (e.g., temperature, salinity) in the LCR and estuary were routinely monitored throughout construction and were compared to pre-project conditions defined by 10 years of data. The formal evaluation process defined by the AEM program ensured that juvenile salmonid habitat quality and availability were not diminished by dredging and disposal of dredged materials.

Additional direct environmental benefits were produced by substantial investments in pre-construction studies. These studies helped to avoid and minimize potential impacts of project construction on entrainment and burial of Dungeness crab. Similar pre-project studies produced new information concerning the effects of salinity on the migratory behavior of age 1+ crabs. This increased understanding and permitted scheduling of project construction to avoid entrainment of these ecologically and economically vital organisms. Project construction was also carefully scheduled to avoid impacts on migrating smelt (eulachon).

The effects of dredging and disposal of dredged materials on the movements and foraging behavior of sturgeon were also evaluated prior to project construction. Tagged individuals were tracked in relation to localized dredging activities. The results of these studies not only demonstrated that dredging has negligible effects on sturgeon behavior, but also provided new information describing the seasonal and long range migratory activities of these valued fish. This project greatly contributed to increasing basic understanding the ecology of sturgeon.

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Detailed studies of fish stranding by navigating commercial vessels in the LCR permitted quantitative assessment of potential indirect effects of channel modification. These studies quantified complex relationships between beach structure, channel bathymetry, vessel type, and vessel speed, all of which influence the probability of fish stranding. The results of these studies were used to assess post-construction fish stranding and identify specific locations where dredged materials might be used beneficially to avoid or reduce the probability of fish stranding.

The AMT also examined the potential indirect ecological effects of chemical contaminants in sediments suspended by construction activities. They assessed the effects through a comprehensive sampling of river sediments throughout the LCR. Analysis of the samples demonstrated that project construction was unlikely to pose chemical risks to aquatic species. Further, the analysis permitted in-water disposal and other beneficial uses of the project's dredged materials.

Though not directly related to project construction, the CRCIP provided opportunities for the accrual of environmental benefits in relation to ecosystem restoration. Ecosystem restoration actions focused on re-establishment of native riparian vegetation on selected islands (Cottonwood and Chumley Islands), control of the invasive purple loosestrife, and re-introduction of native white-tailed deer to Cottonwood Island.

The AMT continues to work on environmental issues related to the CRCIP. Over the next few years, additional pre-construction characterization of shallow-water habitats vital to juvenile salmon growth and survival will be compared with post-construction conditions to identify opportunities for beneficial uses of dredged materials in maintaining or increasing habitat. In addition, annual crossline surveys at selected river locations are being used to evaluate accretion or erosion of channel side slopes in relation to project construction. These areas serve as important habitat for certain juvenile salmon, as well as sturgeon.

Two unique environmental challenges were addressed throughout this project. The first was the removal of rock (i.e., blasting) at several locations using techniques that posed minimal risk to worker safety, navigation, and aquatic organisms. State-of-the-art rock removal technologies in combination with highly organized operational procedures limited effects on marine mammals and minimized risks to other aquatic organisms. This activity was supported by rigorous, timely monitoring and reporting of biota effects due to blasting. The second, more important challenge was the successful organization and continued operation of a formal AEM program. The program permitted regular and timely monitoring and evaluation of the overall project in relation to the many environmental risks and benefits previously described.

Innovation: Using Unique Strategies to Overcome Environmental Obstacles

The development of this AEM program was a key innovation for the Corps in implementing the CRCIP. The AEM program extends traditional Corps approaches to project planning and construction through regular monitoring and evaluation of project performance. The program does this in relation to terms and conditions agreed upon by Corps and participating federal and state agencies.

As previously noted, in 2000 NMFS withdrew their BO of "No Jeopardy" concerning the expected impacts of the CRCIP on listed salmonids. This withdrawal resulted in part from the availability of new information regarding the anticipated effects of the Project on bathymetry, flows, estuarine habitat, and suspension of chemical contaminants. The Corps and NMFS consulted to resolve the issues of concern. A new Biological Assessment (BA) was prepared by the Corps following a series of technical reviews, expert panel workshops, ad hoc meetings, and a survey - activities facilitated by the Sustainable Ecosystems Institute during 2001. The new BA (Corps 2001), submitted in January 2002, specified compliance measures to minimize the incidental take of listed species; monitoring to ensure minimal impacts of dredging and deepening on listed fish and their habitats; and adaptive management to respond to impacts observed during monitoring.

The AEM Plan identified the key role played by the Corps in this process and underscored the initial focus on managing channel improvements to minimize the potential impacts on the basic physical-chemical attributes of the LCR and estuary. The plan identified important federal and state agencies, Tribes, and

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the Sponsor Ports as active participants in the AEM process. The roles and responsibilities of the federal and state agencies were determined in part by their respective mandates and interests. For example, NMFS and USFWS are entrusted with enforcement of the Endangered Species Act; Washington and Oregon are responsible for Section 401 provisions of the Clean Water Act; the Sponsor Ports are concerned with the economic aspects of channel improvement; state resource agencies monitor wetlands and water quality issues; and the Tribes focus on access to a valued salmon fishery.

For this project, the AMT developed an adaptive management plan and an operating charter. Using pre-Project (1996-2004) data and results of studies commissioned by the Corps on Dungeness crab, sturgeon, and fish stranding, the Team also developed specific values of project performance measures and risk endpoints (i.e., decision criteria) for use in evaluating monitoring data to be collected during and after Project construction.

The scope of the AEM Plan and implementation process was to manage the CRCIP in an adaptive manner, to avoid or minimize physical-chemical impacts in relation to channel deepening in the LCR and estuary. The process focused on short- and mid-term management actions and system responses. Mid-term management actions included the use of monitoring/ research results to establish trends in the physical aspects of the systems. Other potential resources of concern, depending on the results of the near-term system responses to channel improvements, were also considered. The long-term actions include years 10 and beyond.

The AMT was comprised of managers, decision makers, and technical staff from federal and state agencies, and Sponsor Ports. The team was ultimately responsible for initiating, carrying out, and sustaining the AEM Process. The organizational structure encouraged interactions with the scientific and technical community, as well as concerned stakeholders. Fisheries biologists, ecosystem scientists, environmental toxicologists, risk analysts, and hydrologic engineers were consulted as needed.

To facilitate adaptive management, the AMT regularly received information from technical resources that described current conditions and trends for selected Project performance measures or risk endpoints. The AMT made recommendations based on deliberations that may draw upon technical inputs, as well as advice solicited from the general scientific community. The AMT also made any necessary changes in the conduct of the Project in order to achieve and maintain the Project AEM goals and objectives.

The AEM Program will now begin to address the nature and form of continued adaptive management as the Project transforms from construction to operation and maintenance. Information detailing the nature and operation of the CRCIP AEM Program was placed on the Corps web site (<http://www.nwp.usace.army.mil/issues/crcip/aem/home.asp>).

CRCIP: Continued Economic Benefits for the Northwest and Nation

Throughout the 20 year design and construction of the CRCIP, layers of economic benefits have been created. Local construction workers were employed. Corps staff and local officials were hired. Dredge contractors and other businesses spent hundreds of thousands of dollars in local hotels, restaurants and business. The last mile of rock blasting alone contributed nearly 60 jobs and millions of dollars in local investment to the fragile 2009 economy of the Pacific Northwest.

Our region and the nation continue to reap economic benefits. Over \$900 million in new investment has been made to date in the Lower Columbia River, largely due to the channel deepening project. At the Port of Longview, WA the first export grain facility in North America in over 25 years is being built. The \$200 million state-of-the-art facility owned by EGT will open as early as August 2011, in time for this year's harvest. CHS, Inc and United Harvest are investing a combined \$136 in grain terminal improvements at the Port of Kalama. The Port of Vancouver, USA is seeing \$450 million in new investment, including \$150 million in rail freight access and over \$300 million in private investment for new exports at the grain elevators and terminal improvements. \$123.7 million is being invested in berth deepening and in terminal lease payments at the Port of Portland. Also, vessels will now be able to carry an additional 6,000 tons of cargo valued at \$1-2 million, another direct benefit of the channel's additional 3 feet of depth.

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In addition to these direct benefits, the CRCIP supports the entire Columbia Snake River System. As the deep draft portion of the CSRS, this project provides a critical link for imports and exports for the states of Idaho, Montana, Oregon and Washington. The economies of these four states rely heavily on the commerce that flows up and down this system. The CSRS is the #1 U.S. wheat export gateway, #1 U.S. barley export gateway, #1 West Coast wood export gateway, #1 in West Coast mineral bulk exports, and #2 on the West Coast for auto imports. The deep draft channel supports 40 million tons of cargo each year, valued at \$17 billion. The inland system supports 10 million tons of cargo, valued at \$3 billion annually. Overall trade on the system, and throughout the Pacific Northwest, is expected to increase significantly in the future. The CRCIP ensures that the CSRS can handle this expected growth.

Transferability: Continued Use of Adaptive Management Approach

The overall approach to AEM developed in support of the CRCIP can be applied to other dredging projects. The strategic aspects of the AEM Plan designed for the CRCIP are generically transferable. In fact, this AEM program, even as it transitions to support channel operations and maintenance dredging, continues to be recognized as setting a standard for future Corps Adaptive Management (AM) activities.

Eight years ago, when the AMT was established, the concept of AM was a fairly new concept that was being applied to large ecosystem restoration projects. When AM was made a requirement of the federal and state clearances for the CRCIP, there was yet to be an AMT that had successfully started within the Corps or any other federal or state agencies across the country. After over six years of a successful AMT, the Corps and other state and federal agencies have recognized the success of the CRCIP AMT and have used it as a model for other major projects across the country. Corps Headquarters is developing an AM technical guidance document that adopts many CRCIP AMT concepts, to assist in developing additional AMTs in the future.

In the last two years as part of a Corps initiative to create and generate interests and comments on the new AM guide, the AMT has presented the details of the team at several environmental conferences around the country and overseas to help educate other agencies and non-profits on the feasibility and benefits of AM.

Outreach and Education: Working With Stakeholders, the Public and Congress

The AMT, in essence, constitutes a formal mechanism within the CRCIP AEM process for outreach, collaboration, communication, discussion and resolution of important environmental issues among the major participating federal and state agencies. As an AMT participant, the Corps worked extensively to educate the public and stakeholders. They held numerous public meetings and made annual reports from the AEM available on the Portland District web site. As additional outreach, the Corps held 17 environmental roundtables, numerous editorial boards, salinity and wildlife mitigation workshops, ocean dredged material working group meetings and a cost/benefit technical panel meeting in Vancouver, Longview and Astoria. This outreach ensured a balanced public process in the states of both Oregon and Washington.

In the spirit of openness and transparency, the Corps has maintained a webpage (<http://www.nwp.usace.army.mil/issues/crcip/aem/home.asp>) since the inception of the AMT where all AMT presentations, actions and decision points were posted to inform and educate the public on the CRCIP AMT and the AM process. The website has been a resource to other Corps districts and private industry to help model and develop their own AM plan and organize their individual AMTs.

As part of their outreach and education, the Corps also worked with federal and state advocates for the project, including the six local port sponsors, the Pacific Northwest Waterways Association (PNWA) and the Columbia River Channel Coalition (CRCC). In addition to their collaborative efforts, these organizations carried out their own outreach efforts as well.

The CRCC performed the majority of the CRCIP's community outreach efforts. Beginning in 1997, the CRCC worked to inform and persuade organizations throughout the Northwest about the economic

www.pnwa.net

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importance and environmental soundness of the Project. One-on-one meetings, group presentations, printed newsletters, e-mail updates, informational tours, and other outreach was done to agricultural, business, labor union, maritime, and community groups.

The CRCC asked opinion leaders and organizations to endorse the CRCIP, and over 250 groups signed on as supportive entities. Legislative lobby days with these leaders and partner groups were organized in both Olympia, WA and Salem, OR to demonstrate support for the Project, resulting in \$27.7 million in matching funds from both Oregon and Washington. Regular roundtable briefings were organized with Project supporters and Congressional members, and legitimate concerns about the Project were identified and addressed, either through CRCIP changes or other negotiations.

For over 20 years, the PNWA also collaborated with the Corps to tell the story of channel deepening. PNWA is a trade association comprised of multiple industries in the public and private sectors in Oregon, Washington, Idaho, and California. Their members include public ports, navigation, trade, tourism, agriculture, forest products, energy and local government interests. PNWA works with the U.S. Congress, federal agencies and regional decision leaders on transportation, trade, tourism, energy and environmental policy to enhance economic vitality and environmental sustainability in the Pacific Northwest.

Throughout the project, PNWA acted as a liaison between the Corps and stakeholders, helping to get accurate information in the hands of river users and decision makers. They co-hosted tours of the deepening project to generate a deeper understanding of the work that was being done. PNWA reached out to Congress to ensure that the Northwest delegation knew the funding needs of the project and that the federal dollars being used were well spent. They continue to educate and work with stakeholders to promote the vast economic and environmental improvements created by the CRCIP.

Additional Benefits

During the CRCIP, a National Environmental Policy Act (NEPA) lawsuit generated 31,000 pages of administrative record. It was because of the AEM effort and the Corps goal to be open, transparent and rely on best available science that the Corps was able to prevail. The Corps won the lawsuit in District Court (June 2005), the 9th Circuit Court of Appeal (Aug 2006), and the Appeal to the 9th Circuit (Dec 2006). This was the first time the Corps prevailed in the 9th Circuit Court of Appeals. When the Corps was brought in front of the State of Washington Water Pollution Control Board, the project also prevailed. A settlement agreement was ultimately reached between the Corps and the Webb Diking District to complete construction of the required mitigation site.

The CRCIP AEM program presents the Corps' nationally recognized innovative approach to (1) promote understanding and communication of key environmental issues associated with a specific dredging project, (2) provide a forum for stimulating novel solutions to emerging issues (e.g., contribution of CRCIP to regional sediment management), and (3) facilitate the efficient completion of dredging and disposal of dredged materials while meeting specified environmental goals. Thus, the CRCIP AEM program exemplifies in action the broader goals stated by WEDA in relation to its Environmental Excellence Award. We thank WEDA for its consideration.

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Figure 1. Detailed map showing scope of the Channel Improvement Project.



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Figure 2. Flow chart describing the proposed AEM Process in support of the Channel Improvement Project.

