- Final -
CRCIP AMT Quarterly Meeting Notes
September 12, 2013

The CRCIP Adaptive Management Team held its quarterly scheduled meeting from 9:30 am – 3:30 pm on September 12, 2013 at the Robert Duncan Plaza. The meeting was delayed from its usual July timeframe in part due to scheduling conflicts of participants and to allow more time for generation of modeling results in support of MA-4 activities. The following AMT members, technical support personnel, and invited guests participated in person:

Greg Smith, USACE	Shyam Nair, E2	Steve Bartell, CardnoENTRIX
Greta Smith, USACE	Jeff Fisher, NMFS	Charles Seaton, OHSU
Jessica Stokke, USACE	Antonio Baptista, OHSU	Richard Mraz, WDOE
Mike Ott, USACE	Paula Calvert, ODEQ	Dan Bottom, NMFS

April 2013 AMT Meeting Notes

Draft meeting notes for the April 2013 AMT meeting were provided to the AMT members prior to the September 2013 meeting. The draft meeting notes for the April 2013 AMT meeting were approved as final through communications with the AMT prior to the September 2013 meeting. Therefore, the April meeting notes were not discussed during the September AMT meeting.

The finalized meeting notes for the April 2013 AMT quarterly meeting were posted to the E2 CRCIP web site prior to the September meeting.

The following topics were addressed by the AMT participants during the September 2013 quarterly meeting:

O&M and Project Mitigation Updates

Jessica Stokke (USACE) provided updates for operations and maintenance and project mitigation at the September 2013 AMT meeting.

<u>O&M</u>

Approximately 3.7 million cubic yards (mcy) have been removed to date in 2013 as part of the continuing O&M of the navigation channel; approximately 1.5 mcy are planned for the remainder of 2013. Eighty-five percent of the dredged materials have been placed in-water. The remaining 15% has been placed at upland or shoreline sites. The year-end target is for 20% of O&M dredged materials to be placed at upland or shoreline sites.

The projected end-of-year maintenance is estimated at 5-6 million cubic yards, depending on available funding. This projection does not include advance maintenance of the 43’ channel.

Jessica provided the AMT with hardcopy of the current Columbia River Local CCI/Shoaling Report, which is a comprehensive tabular summary that indicates the minimum surveyed depths across four channel quarters (cross-sectional areas) at each reach within the navigation channel. The shoaling report serves as a convenient summary of potential problem areas for commercial navigation. The report can importantly guide the allocation of limited resources available for dredging. Plots of the mean daily discharges at Bonneville Dam were also provided to describe the 2013 discharges and put them into the context of data averaged from 1990-2012; discharges were also plotted separately for 2011 and 2012. The 2013 flows were higher than the 1990-2012 averages for much of April and May, as well as part of July. However, the 2013 flows were generally less than those reported for 2011 and 2012. The comparatively high flows during 2011-2013 have proven a major source of extensive shoaling noted during these three years.

The overall channel condition is improved in 2013 as compared to 2011 and 2012. However, shoaling above the authorized depth of 43 feet forced the Columbia River pilots to begin restricting commercial vessel drafts to 42 feet on September 9.

The shoaling report and the Bonneville discharge plots will be uploaded to the E2 CRCIP website and placed in the Workbook under O&M Reporting. (The E2 website information will be provided to Jeff Fisher, NMFS, and newly appointed to the AMT.)

Mitigation

The principal mitigation activities include the restoration of native riparian vegetation and/or wetlands at Chumbley, Cottonwood, and Webb sites. The plantings at Chumbley site continue to thrive. Poison hemlock was removed from the roadside at Chumbley earlier in the summer. Contracting efforts are expected to be completed in September for mowing and spraying invasive species to protect the new plantings on Cottonwood Island. Restored areas at Webb site were mowed in early summer and are scheduled for a second mowing in October – November 2013. In addition, plans for a topographic survey within the wetlands on Webb should be completed in September. The survey results will be used to improve flows and water depths. The mitigation activities at Webb site are presumed to enhance overwintering foraging habitat for migratory waterfowl.

Rick Mraz (WDOE) expressed interest in a site visit to Cottonwood Island.

AEM Workbook 2nd Quarter Review for 2013

The following relevant components of the CRCIP AEM Workbook were discussed at the September 2013 quarterly meeting.

MA-1 CORIE Analyses

The available data for the September 2013 AMT meeting reflect the previous and current status of the CORIE (CMOP) stations required for the MA-1 analyses. The following data were available for analysis prior to the September meeting:

- grays: temperature, salinity and depth (April through August 2013)
- tansy: temperature and salinity (April through August 2013)
- woody: temperature (April through August 2013)
- cbnc3: temperature and salinity (no data)
- dsdma: salinity (no data)

Temperature

Daily median water temperature values calculated for the tansy station for the April – August 2013 period were generally within the 80th and 95th percentile decision criteria. Temperatures appeared somewhat elevated during this time period, although the majority of the values for July and August were between the 20th and 80th decision criteria.

For the April – August 2013 period, daily median values of water temperature computed for the grays station demonstrated a temporal pattern similar to the tansy station, although somewhat less elevated than tansy. Temperature values at grays were generally within the 20th and 80th percentile decision criteria. However, daily values for the first week in June ranged between the 5th and 20th percentiles; values in the last week of June were within the 80th and 95th percentile criteria. Values for the second half of August were similarly within the 80th and 95th percentile criteria.

The availability of April – August temperature data from the woody station permitted the development of normalized water temperature plots for this time period in 2013. The plots were constructed for the tansy and grays stations. Inspection of the normalized temperature plots for 2013 indicated that the comparisons were consistent in the overall pattern defined by the pre-Project (1996-2004) normalization.

The monthly averaged median temperature values for tansy were within the 80th – 95th decision criteria for May, June, and July in 2013. The April and August 2013 values were within the 20th – 80th percentile decision criteria. The monthly averaged median temperature values for grays were within the 20th – 80th percentile decision criteria for the April – August 2013 time period.

Analysis of the post-Project construction CORIE data available through August 2013 continues to suggest that the channel improvements did not have any measurable impact on water temperatures recorded at the MA-1 stations.

Salinity

Similar to the January – March 2013 period, the April - August daily median salinity values computed using data available for the tansy station were generally at the lower range of values defined by the 20th-80th percentile decision criteria. However, many of the daily median values were less than the 20th percentile criteria values for April and May. No values exceeded the 5th or 95th percentile decision criteria.

Daily median values calculated for salinity data available from April through mid-July 2013 for the grays station were mainly distributed between the 5th and 20th percentile decision criteria. Values for later in July and throughout August were within the 20th - 80th percentile decision criteria.

Salinity data were not available for the dsdma station during April – August 2013. Therefore, normalized salinity plots were not developed for this time period. If the dsdma salinity data become available for this period, the normalized plots will be developed and presented at a future AMT meeting.

The monthly averaged daily median values of salinity for the tansy station were within the 20th – 80th percentile decision criteria for April, June, July, and August 2013. The May monthly average value was equal to the 20th percentile decision criterion (2.7 psu). The corresponding monthly averaged values for grays were within the 5th – 20th percentile decision criteria for April, May, and June 2013. The July and August 2013 monthly averages were within the 20th – 80th percentile decision criteria.

The post-Project construction CORIE data available through August of 2013 continue to suggest that the channel improvements did not result in any significant saltwater intrusions at the MA-1 stations.

Depth

Depth data were available for only the grays station from April through August 2013. Daily median depths were well within the previously established AMT decision criteria. The monthly average values calculated for this time period were within the corresponding 20th and 80th percentile decision criteria.

Extended Time-Series Plots

Shyam Nair (E2) continued the multi-year time series plots of temperature, salinity, and depth for the MA-1 CORIE stations. These plots were updated based on data available through August 2013 and presented at the September 2013 meeting.

Correlations for cbnc3 Data

Water temperature and salinity data were obtained for cbnc3 during April, May, and June 2013 at depths of 6.9 and 9.0 meters. Shyam Nair (E2) examined the correlations of data sampled at the two different depths. The correlation for water temperature was 0.9998. The correlation for salinity was 0.9657. Based on these analyses, it will be possible to use the correlations to fill in missing temperature and salinity data for cbnc3 and include these interpolated data in revisions of MA-1 analysis for this sample location. It was suggested that the reconstructed cbnc3 values be designated by a distinguishing color when plotted for analysis.

The results of the 2nd quarter 2013 MA-1 analysis have been posted in the MA-1 folder of the AEM Workbook on the E2 CRCIP web site.

MA-3 Crossline Surveys

The results of the 2013 crossline surveys were presented at the September 2013 AMT meeting. The 2013 post-construction surveys were performed on the following dates:

- Wauna Driscoll (CRM 41.5-42.5) – May 7, 2013
- Westport Bar (CRM 45.5-46.5) – May 8, 2013
- Upper Dobelbower (CRM 71.5-72.5) – March 20, 2013
- Kalama Bar (CRM 74.5-75.5) – March 20, 2013
- St. Helens Bar (CRM 85.5-86.5) –January 28, 2013
- Morgan Bar (CRM 98.5-99.5) – January 30, 2013

The results of the surveys indicated erosion values outside of the "variance envelopes" at the following locations:

- Wauna Driscoll CRM 41.5 – Washington side of the channel
- Westport Bar CRM 45.5 Oregon side and CRM 46.0 Oregon and Washington sides
- Upper Dobelbower CRM 71.5 Oregon side of channel
- Kalama Bar CRM 75.0 Oregon side, and CRM75.5 Washington side
- St. Helens Bar CRM 86.5 Oregon side of channel
- Morgan Bar CRM 98.5 Washington side and CRM 99.5 Washington side

The results of the surveys indicated accretion values outside of the "variance envelopes" at the following locations:

- Wauna Driscoll CRM 41.5 – Oregon side of the channel
- Westport Bar CRM 45.5 Oregon and Washington side
- Upper Dobelbower CRM 72.5 Washington side of channel
- Kalama Bar (none)
- St. Helens Bar CRM 85.5 Oregon side of channel
- Morgan Bar CRM 98.5 Washington side

The erosion variance at CRM 41.5 (Wauna Driscoll) seemed unusually high compared to recent previous years (2007-2012). At the same time, this 2013 exceedance did not seem substantial when viewed in relation to the entire variance envelope for CRM 41.5, which was calculated using data from 1996-2006. The AMT requested that crossline surveys be plotted for all available years for CRM 41.5 for review and discussion at the October AMT.

MA-4 Habitat Analyses

The analysis of habitat in relation to the AM requirements for MA-4 continued at the April 2013 meeting with a presentation of progress on modeling activities by Drs. Antonio Baptista (OHSU) and Dan Bottom (NWF). (See separate MA-4 agenda item below.)

MA-6 Fish Stranding

The AMT reached consensus agreement concerning the resolution of MA-6 terms and conditions at the April 2013 quarterly meeting. Based on the modeling and analysis provided by Dr. Walter Pearson and the formal review of Pearson's work undertaken by Toby Kock and colleagues at PNL, the AMT concluded that no further activity concerning MA-6 was required as part of the CRCIP AEM Program. However, the AMT will monitor the activities of the Multiagency Fish Stranding workshops.

Multi-Agency Fish Stranding Workshop Summary

Greg Smith (USACE) and Jeff Fisher (NMFS) summarized the recent multi-agency fish stranding workshop. Led primarily by NMFS, interested stakeholder agencies have organized to discuss and further understand fish stranding by commercial navigation on the Columbia River. The results of the MA-6 fish stranding studies have been part of the discussion. NMFS is particularly interested in understanding the system-wide implications of stranding. However, the MA-6 effort examined only three beaches known to be susceptible to fish stranding. Minimally, all beaches should be classified as high, medium, and low in terms of stranding potential. The interested workshop stakeholders understand the need and the difficulty of assessing the cumulative impacts of stranding on fish population dynamics. Age-0 fish, especially Columbia River chum, appear particularly vulnerable. Current indications are that 50,000 fish might be stranded each year on the Columbia River. This value is likely a substantial underestimate. Fish stranding is of continued and increasing interest because commercial shipping on the Columbia is anticipated to increase by 900-1,000 vessels/year. The workshop recognized at least two possible courses of future action in relation to stranding: (1) additional verification studies to further characterize the stranding process, and (2) modification of beaches to reduce stranding (e.g., beneficial uses of dredged materials).

NMFS and other workshop participants are exploring the use of collaborative funding mechanisms (e.g., RFPs, grants, etc.) to comprehensively address fish stranding on the Columbia River.

MA-4 Discussion of Overall Modeling Approach and Results to Date

Dr. Antonio Baptista presented results obtained since the January 2013 AMT meeting for four circulation-derived metrics: (1) plume volume, (2) salinity intrusion length, (3) shallow water habitat, and (4) salmon habitat opportunity. The latter three metrics are of primary importance to MA-4. The results were calculated using the 2003 (pre-construction) and 2012 (post-construction) bank-to-bank bathymetry data. The potential impacts were also calculated by imposing the 2012 bathymetry directly on the 2003 data (with unrelated effects "filtered out"). Results for these two approaches for evaluating changes in bathymetry were simulated for years 2001, 2011, and 2012. Additional simulations are underway for other years (e.g., 1999). The results have been summarized for eight (A-H) geographic river reaches that describe the Lower Columbia River and estuary. Reach A includes the mouth of the Columbia River, while reach H extends to the Bonneville Dam.

Model results for plume volume showed differences between the 2012 and 2003 bathymetry scenarios on the order of ±20% and are characterized by large seasonal and inter-annual variability. Changes in plume volume directly attributable to the CRCIP appear on the order of ±2%. However, plume values attributable to the Project that exceed 2% are evident in the first quarter of 2012. These results are currently under investigation.

Similarly, model results for salinity intrusion length (SIL) differ substantially for the 2012 and 2003 bathymetry data. Changes are on the order of ±10%, and similar to SIL results, exhibit large seasonal and inter-annual variability. Corresponding changes in SIL directly attributable to the CRCIP appear on the order of ±1%. The overall results suggest a small net decrease in SIL. The pre-Project concerns of the AMT were that channel modifications might increase salinity intrusions into the Lower River and estuary and potentially reduce habitat quality and availability for juvenile salmonids.

Modeled shallow water habitat (SWH) is concentrated mainly in the lower estuary (reaches A-C) and downstream of the confluence with the Willamette (reach F). Changes in modeled SWH in these lower reaches are not dramatically affected by changes in the 2012 and 2003 bathymetry, although modeled SWH in reach A increases consistently between the 2003 and 2012 bathymetry scenarios. SWH is more strongly influenced between 2003 and 2012 in the upper reaches; reach H shows the most significant differences (±). Model results for SWH are strongly influenced by variations in river discharge for reaches C-H. In contrast, modeled SWH in reaches A and B are less sensitive to variations in discharge.

The model results for salmon habitat opportunity (SHO) were measurably different between the 2003 and 2012 bathymetry scenarios. However, the changes were minimally associated with the CRCIP channel modifications. The modeled increases in shallow water habitat for reach A between 2003 and 2012 bathymetry translated into corresponding increases in SHO for this reach. Some of the increase in SHO for reach A resulted from modeled reductions in the salinity intrusion lengths. Reaches D, G, and H exhibited the largest changes in SHO among the modeled reaches. Reaches B and C demonstrated essentially no change in SHO between the 2003 and 2012 bathymetry.

Dr. Baptista stated that the next steps in the modeling process would include (1) completion of the 1999 simulations, (2) detailed evaluation of model results (QA/QC), (3) perform a more detailed analysis of the model results attributable to the CRCIP, and (4) generate a final report. To complete the modeling effort, Baptista requested advice from the AMT concerning what constituted changes between 2003 and 2012 that could be directly attributed to the CRCIP. Baptista and his colleagues will refine the modeling and analysis of potential impacts to salmon based on feedback to be provided after the October 2013 AMT meeting.

Dr. Dan Bottom (Northwest Fisheries Science Center) presented an assessment of the CRCIP in relation to salmon habitat opportunity and salmon ecology in the Lower Columbia River and estuary. The ongoing work is complementary to the previously described modeling work performed by Dr. Baptista and his colleagues at OHSU. Bottom identified four major changes in the estuary that have contributed to salmon decline: (1) loss of estuarine habitat, (2) reduced habitat opportunity and capacity, (3) reduced detrital sources for salmonid food webs, and (4) reduced salmon life history diversity. Based on surveys (2002-2007) in the estuary, Bottom determined that juvenile salmon peak in abundance during late spring and early summer, and then rapidly decline in July. Abundance also decreases along a salinity gradient from the tidal fresh to the marine zone. Juvenile salmon utilize different habitats within the estuary depending on individual fish size: larger individuals appear to use the main channel, while smaller fish remain in shallow water habitats. Larger fish also spend less time in the estuary before entering the ocean. Importantly, Dr. Bottom reviewed the physical modeling results relative to sensitive times, locations, and stocks of juvenile salmon. Bottom identified potentially sensitive areas as reach B in the oligohaline transition zone used by lower Columbia River stocks and reaches F, G, and H in the tidal transition used by interior stocks. Potentially sensitive time periods include the spring peak in juvenile abundance and the summer/fall seasonal transition when flows are low, temperatures are high, and late migrants are correspondingly stressed. Bottom concluded from the Baptista modeling results that bathymetric changes from the CRCIP would most directly have affected deeper habitats favored by yearlings and large sub-yearlings. However, the modeled changes in habitat opportunity were minor for most reaches and time periods except for reach H where the simulation results produced by Baptista suggest comparatively greater possible impacts.

The September 2013 presentations by Drs. Baptista and Bottom will be uploaded to the E2 CRCIP web site and placed in the MA-4 component of the electronic AEM Workbook.

October 2013 Agenda Items

The following were identified as items for the October 2013 AMT meeting:

- Further review of cross section surveys for CRM 41.5
- Discussion of MA-4 modeling activities; specifically, the AMT's position on Baptista's question, "what would constitute as a significant change between 2003 and 2012 that could be directly attributed to the CRCIP."

The September 2013 AMT meeting adjourned at 3:45 pm PDT.