

FINAL MINUTES

27th Meeting of the NECC
November 3, 1999
Holiday Inn - Moline, IL

by

Brad Thompson
(CEMVR-PM-M)

Navigation Environmental Coordination Committee (NECC)

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1. Welcome and Approval of Minutes of Last Meeting

The 27th meeting of the Upper Mississippi River-Illinois Waterway System Navigation Study Navigation Environmental Coordination Committee (NECC) was called to order by Ken Barr, Chairman. Ken noted the attendance of Jim Hall, Iowa Department of Transportation, who is the Iowa representative on the Governor's Liaison Committee (GLC). . An attendance list is provided as the last page of these minutes. The minutes for both the 25th (May 4-5, 1999) and 26th (July 20, 1999) meetings were presented for comment or correction. No comments or corrections were offered.

2. Study Status - Ken Barr

Ken noted that an additional alternative to those presented at the public workshops is now being evaluated. It is the same as alternative H (Locks at 20-25, Peoria and LaGrange and Powered Kevel Guidewalls 14-18), with three differences: Mooring cells are added at 12, 18, 20, 22 and 24; the contingency costs at Peoria and LaGrange are reduced from 35% to 25%; and, rehabilitation cost savings are revised. Ken noted that these factors make lock improvements on the Illinois more competitive (e.g. improves the net benefits).

Questions/Comments:

Dave Tipple added that optimization of the economic model runs is continuing, and that the Corps is aiming for a full discussion at the GLC (on November 18).

Jon Duyvejonck asked when a full array of alternatives and a recommended plan would be available, for purposes of the Coordination Act Report (CAR).

Dave Tipple replied that there should be an initial discussion at the GLC, but the final package may not be ready until closer to Christmas.

Jon Duyvejonck said that for purposes of starting the CAR 90-day clock, he needs some description of the alternatives.

Ken Barr said the study team could provide this next week.

Ken stated that there would not be a final recommended plan until the Division Commander's Notice in December 2000. What the Corps will provide is the current leader, as soon as it's available. This is due to the fact that a Recommended Plan will not be finalized until information from the states, agencies, CAR, and Public Meetings is available. Ken added that the Corps study team would be meeting on 15 November to address policy issues with staff from MVD and HQ. We will be taking comments from today's meeting as well as any others we receive by that time to that meeting for consideration.

Ken went through a brief presentation on the traffic levels associated with the without project and various alternatives. The graphics were based on the same tabular data that the NECC had received in the first, October 8th, mailing of information. In general the information shows that minimal changes are expected in the future without on the Mississippi River due to current congestion levels. In contrast, the Illinois River is anticipated to see greater increases due to the potential associated with open pass conditions and the longer navigation season.

Questions/Comments:

Mark Beorkrem requested that for future meetings the graphs be shown in tows per day.

Gretchen Benjamin asked for clarification on the difference between alternatives F, H, and H' (since designated J).

Brad Thompson clarified that differences have to do with the improvements at Peoria and LaGrange and whether or not there are mooring cells improvements on the Mississippi River. All three alternatives have guidewall extensions at UMR lock 14-18 and lock extensions at UMR lock 20-25. The differences are summarized below.

F: Guidewall extensions at Peoria and LaGrange, mooring buoys/cells at UMR Locks 12, 18, 20, 22, 24.

H: New 1,200 ft locks at Peoria and LaGrange, no mooring buoys/cells

H'/J: New 1,200 ft locks at Peoria and LaGrange, mooring buoys/cells at UMR Locks 12, 18, 20, 22, 24.

3. Backwater Sedimentation - Tom Pokrefke

Tom Pokrefke reviewed the information that was provided in the packets. The models utilized in this effort included: NAVEFF model (evaluated physical effects of tows - currents and waves); NAVSED model (takes the physical effects and tracks effects on resuspended sediments), and BACKSED model (calculated how much sediment is stirred up and potentially moved into backwaters). The NAVSED model is different for the Illinois River, which has a much higher blockage ratio (portion of river cross section occupied by the tow). He noted that efforts are underway to provide information on Pools 1-3 as well.

In terms of tow impacts the analysis focused on the 50% rollup value. This is the median impact tow, which has roughly the mean impact on resuspended sediments of the 108 potential tow types evaluated. Tom Pokrefke highlighted that the numbers are sensitive to the tow type (direction, sailing line, loaded/unloaded, river stage, etc.). The results were initially shown in tons per year delivered to a backwater and years to fill. However, based on requests of the NECC, the results were put into an alternative format using three screening criteria. They include delivery rate in cm/yr (blue <0.1, yellow >0.1 and <1.0, and red >1.0), annual sediment load (1.0 acre-feet/year or greater was colored yellow), and annual load and inlet width (.005 acre-feet/year/meter of width was colored yellow). These criteria were used to color areas of impact. The blue areas are anticipated to experience minimal impacts, while additional efforts and potential mitigation will focus on the yellow and red areas.

Gretchen Benjamin asked for clarification that the delivery rate criteria assume an even rate of sediment deposition in the entire backwater.

Tom Pokrefke stated that this is the case, and that is one of the reasons the other criteria were added to address concerns with more localized issues associated with sedimentation near a particular inlet.

Tom reviewed some of the backwaters identified as having medium impacts. A few of these areas were highlighted based on multiple criteria. Tom stated that the rates used in the analysis were based on total traffic, not just the increment associated with improvements. He noted that in no cases did the increment change the assessment color of a backwater. In other words, if a backwater was yellow under one alternative, it would also be shown as yellow under the without project and all other alternatives.

Jim Hall asked if the range for yellow coding delivery rate could be summarized as a filling rate of between 30 years and 300 years to accumulate 1 foot of sediment deposition.

Tom Pokrefke stated that it could be interpreted that way, but filling is actually more complicated. The analysis only looked at the potential for tow related delivery, not filling. This is due to the fact that the analysis did not account for sediments which might pass through the backwater or other factors which might contribute sediments (various flow events, wind fetch, tributary stream, etc.).

Dan Wilcox added that a conservative approach was used in considering tow impacts which assumed all sediment were deposited in the backwaters, when in many areas some or all of the sediment may pass through with ambient currents or get scoured out during floods.

Gretchen Benjamin stated that deposition would not be uniform.

Ken Barr agreed and stated that this was one of the key reasons for using multiple criteria and doing additional data collection, monitoring, and adaptive mitigation. Jim Hall asked how tow impacts could be separated from other impacts.

Tom Pokrefke stated that natural and tow impacts could not be separated based on the study so far, but this was the reason for additional modeling efforts and data gathering.

Ken Barr pointed out that this is a key point, the study does not prioritize the areas experiencing the greatest overall sedimentation, the intent is only to highlight those backwaters where an increase in traffic may potentially have a significant effect on sedimentation rates.

Tom Pokrefke pointed out that in general, openings with less than 3 feet of depth and areas where the sailing line was within 300 feet were the most likely to be highlighted. In addition, backwaters and side channels with multiple openings and greater flows were more likely to show impacts. This is related to the fact that flows into the backwaters and side channels tend to carry the resuspended sediments into those areas. In contrast, a single opening backwater would only experience sediment delivery related to return flows associated with the drawdowns or possibly some direct propeller effects.

Bill Bertrand asked if a list or map of the backwaters most susceptible to drawdown was available. Bill would like this to be identified, since drawdowns in these areas may present an important impact to fisheries.

Dan Wilcox stated that we are assessing the drawdown along the main channel. However, the drawdown was only extended to the openings. As a result, we do not have the drawdown calculated within the individual backwaters.

Ken Barr stated that some of the work using the HIVE model, which looked at potential water level fluctuations in backwater complexes might provide some information as well. Bill would like to see this information, since it could help improve the understanding of potential spawning impacts and mitigation needs (redesign of openings, etc). Ken stated that the Corps would look into getting whatever information is available on this.

John Barko stated that getting bathymetry data for the backwaters could help aid our understanding of these effects.

Ken Barr added that there will always be additional information that could be collected, but the study has a good methodology to identify the priority areas. The next step is to look at other available information and consider collecting some additional information to develop a reasonable mitigation plan.

Bill Bertrand stated that he believes the drawdown issue is more important on the Illinois River than the Mississippi River due to river's narrower width and proximity of tows to backwater openings.

Tom Pokrefke stated that efforts initially focused on the trend pools and the analysis was then extended to the non-trend pools.

Jon Duyvejonck asked if there was sediment type information, bathymetry, and depth of opening information collected specifically for each backwater opening.

Tom Pokrefke replied that in non-trend pools the detail of information was more limited. Bathymetry data in the non-trend pools was collected every 1 mile and sediment types every 5 miles. These values were then used for openings within that range.

Jon Duyvejonck added that he is concerned that due to these data limitations the analysis may over or understated the actual impacts.

Ken Barr stated that these data limitations are one of the reasons we will go back during later design phases and gather additional data for the backwaters and side channels identified.

Dan Wilcox stated that there is considerable variability in sediment types throughout the system.

Ken Barr reminded the group that originally we were just going to have the more detailed information for the trend pools and then use plan form data for all the non-trend pools. Instead we have done a much more detailed effort for the non-trend pools using data collected by Jim Rogala from UMESC. Ken added that we do have actual depth measurements for openings in the trend pools and for some openings in the non-trend pools. Ken stated that due to limitations the whole effort could have just been done using best professional judgement. However, instead we have included all available data and two years of additional data collection in non-trend pools. In the end, this has given us a sound approach and the best information within a reasonable range.

Bernie Schonhoff noted that three hydraulic/sedimentation models were applied in the trend pools, and two in the non-trend pools, and asked how error was controlled.

Tom Pokrefke replied that all the models were verified to prototype data, and the results were compared to what towboats are doing as to their reasonableness.

Jon Duyvejonck asked what are the next steps.

Ken Barr stated that the intent of efforts to date was to identify the areas of potential impact. We will now gather additional data for these places as needed.

John Barko stated that modeling to date only tracked material to the mouth of the backwaters, and added that the bigger issue is where the settling may occur. It would also improve the understanding of impacts to get more information on sediment types and the depth/width of openings. The reason for gathering additional data is to verify the impacts and plan more successful mitigation.

Information on a few changes that have been made affecting the results for the Illinois River will be provided to the NECC members as soon as possible. As mentioned earlier the computations are different for the Illinois. Because of the smaller channel and more cohesive sediments, the sediments stay in suspension longer and have a greater chance of getting to backwater openings. The depth of water in the main channel is also an important factor. Tom stated that there is a big difference in resuspension between water depths of 4 and 6 meters (depth information was available at 1-mile increments). Boats generally run slower on the Illinois River, which does reduce the impacts.

Mark Beorkrem questions why no efforts were made to identify the effects in the impounded reaches just upstream of the dams.

Tom Pokrefke stated that in general we are not concerned with these, due to the fact that much of the sediment resuspension has to do with wave break (near shore zone). Since these impounded areas tend to be very wide, the greater distances to the near shore zone results in a low likelihood for tow effects. These areas also tend to have greater depths and relatively high scour during higher flows.

Tom stated that the open river analysis was done using a tabletop model. Analyses completed using tow configurations typical to the upper reaches could not be applied to the open river, as tows here are larger. The critical factor in this area was the distance from the sailing line, with impacts greatly reduced for distances to opening of over roughly 100 meters. In addition, the presence of emergent dikes control where tows go, and at lower flows, the tows are generally not close to the openings.

Jon Duyvejonck asked why no areas were identified in the lower pools on the Mississippi River.

Tom Pokrefke stated that this relates primarily to the width and depth of the river. As these factors increase the only susceptible areas tend to be those where the sailing line is roughly 100 meters or less to the openings, such that the direct propeller effects contribute.

Mark Beorkrem asked if anything was done to relate survey information and actual field staff knowledge of sites to model results.

Tom Pokrefke stated that yes this was done.

Tom Pokrefke summarized that on the Upper Mississippi River there are 215 potential backwaters and side channels. Of these 12 (9 backwaters and 3 side channels) were shaded yellow. On the Illinois Waterway 20 (6 backwaters and 14 side channels) were shaded yellow or red of the 71 possible. Members of the NECC requested the summary page and graphic presented.

Ken Barr stated that this effort has allowed us to focus on what areas we feel are most critical. Ken stated that the backwaters and side channels identified are the ones we will be focusing on in starting mitigation planning. He requested feedback from the NECC and that they provide comments on any backwaters not identified, but that they think may be being affected and similarly provide comments on any backwaters that are shown, but that they do not believe are being effected.

Rich Fristik summarized the Corps efforts regarding mitigation planning. We have been working with operations staff to gather additional/available information on the identified sites (flow, sediment types, identified concerns, etc.). Avoid, minimize, or mitigation options are being discussed including structural and non-structural items. One option that has been discussed is moving the sailing lines. However, this has a number of problems that have been identified, such as moving sediment resuspension concerns to another area, training structure and channel geometry, dredging needs, etc.. In general, the concerns with the Illinois River are greater due to the general geomorphology and flow characteristics. The effort is likely to require a programmatic approach, due to concern over the long-term viability of improvements due to the high existing sedimentation rates.

Jon Duyvejonck asked what the mitigation planning outcome would look like. Is the Corps going to have information for each site and a plan for improvements at that site?

Ken Barr stated that yes the Corps will look at each backwater/side channel. The Corps will propose what could be done at each backwater, if mitigation at the particular site is determined to be needed. Ken stated that he sees a recommendation for an active avoid and minimize program being part of any mitigation planning recommendations.

Dan Wilcox highlighted that the mitigation options could include side channel dredging, moving the sailing line, reconfiguring/closing some backwater openings, constructing wave barriers, island construction, placing coarse substrate near openings, dredging backwaters, etc.

Mark Beorkrem asked how restoration undertaken by other efforts (EMP and Illinois Ecosystem Restoration Study) will be taken into account in the EIS.

Ken Barr stated that these other efforts will be mentioned in the EIS, but the Nav Study will identify its mitigation needs and recommend doing that mitigation. These other efforts would continue to address other system problems as needed.

Brad Thompson added that in regards to the Illinois Ecosystem Restoration Study, that the study is still being scoped and that it would work to integrate with any mitigation being done as part of the Navigation Study (if the Nav Study restores some problem backwater as mitigation, the ecosystem study would just be able to focus on other restoration needs).

Ken Barr asked for any comments from the group on the general findings and approach. Ken stated that there may be differences of opinions on what mitigation would actually be required since the traffic increase is not distinguished from the without.

Jon Duyvejonck said that he feels pretty comfortable with the approach taken. His concerns are more practical, he does not want to be tied to a very detailed mitigation plan that may not be fully applied for approximately 20 years. Jon would instead like to see a flexible approach that allows for the use of the best available approaches at the time.

Ken Barr stated that the study team will pursue adaptive mitigation, which would include monitoring and refinements of approaches based on completed efforts.

Jon Duyvejonck supports this approach, but expressed concerned over whether or not it will actually happen.

Bernie Schonhoff agreed with the FWS's assessment, but added that there are a couple areas in the lower pools that he will review and possibly recommend that the Corps evaluate further.

Ken Brummet stated that he will also be looking at a few backwater and side channel areas.

Bill Bertrand stated that he remains concerned over the drawdown in backwaters. He will also look for other sites in the non-trend pools.

Gretchen Benjamin stated that she will look at other areas, which are showing sedimentation. She is also concerned about not including the impounded areas in the study and the fact that the study did not consider overall sedimentation, but instead focused on just the tow contributions.

Jim Hall asked about impacts of recreational traffic on backwaters.

Ken Barr stated that we are still working on getting this information. This information will be available for comparison to commercial traffic impacts. In general the concern is more with overall contributions to wave resuspension in the near shore zone contributing to turbidity. Recreation boats do not have as great of an impact relative to drawdown.

Ken Brummet asked if the information would be available for different size classes.

Ken Barr stated that the effort is looking at various sizes of recreational craft.

4. Plants - Steve Bartell

Steve stated that he would not go through all the plant results already provided. He summarized that in general very minimal impacts were identified. His presentation instead focused on a review of the methodology and the uncertainties. Steve summarized that the uncertainties were related to the inter-arrival times, suspended sediment concentrations after the tow passage (based on tow-type), and what and how various parameters affect the growth of plants. The uncertainties in the suspended sediments relate not only to plants, but also to the mussel results. The model considers the tow types, locations of boats within the channel (90 percent roughly along middle of nav channel), and flow (high, medium, low). These factors were evaluated in the NAVEFF model and NAVSED model. These models move from physical forces to identifying the associated suspended sediments. In running the model, Steve used the median value (50% value) for suspended sediment concentrations for all tows. He stated that to better understand sensitivity he has also looked at the impacts of the 10% and 90% suspended sediment concentration values for tows. The 10% and 90% values should not be used as likely results. This is due to the fact that they represent all large, loaded, upstream tows moving through low water or all small, unloaded, downstream tows moving under high flows, but they do help to bracket the information. Steve is now using the models to identify which factors have the greatest influence on the results.

Bernie Schonhoff asked if actual tow information was used.

Steve Bartell clarified that the values used for the distribution of the 108 tow configurations were based on the actual monthly data for 1992.

Steve summarized that the results show that there is not much difference in the total bio-mass or distribution of the bio-mass under the various alternative plans. The more important factors effecting the distribution of plants relate to the water depth and where you are on the system (turbidity level increases further down the system limiting the distribution of plants). There were essentially no effects for sago pondweed on the tubers, bio-mass, and only limited effects on growth. Only in Pool 13 were there cells with greater than a 5% reduction in bio-mass identified. Wild celery experienced greater effects. These were generally less than a 3.5% bio-mass reduction for pools 4 and 8, but up to a 23% reduction in pool 13 at a 1.5 meter depth.

The locations where there is a potential for a >5% reduction in bio-mass were identified. For these effects, the only areas with bio-mass reductions of greater than 5% were pools 9, 10, 11, and 13 for wild celery, while sago

pondweed impacts were limited to pool 13. We are also getting some information on pool 19 from Richard Anderson from Western Illinois University. In addition to the suspended sediment information the analysis also looked at potential effects associated with waves and currents. Based on available data, only cells with greater than .2 m wave height and .75 m/s currents present risks to plants. Less than 1% of the cells failed these criteria, and those that did fail were related to wave heights. The only major concern appears to be sediment resuspension.

Mitigation measures include gathering additional information on impacts as well as some structural and non-structural measures (moving sailing lines, revetments, floating breakwaters, etc.). Dan stated that the team will go through each area and develop proposed mitigation efforts. Some further verification of the model/growth rates can occur using proposed LTRMP studies being coordinated by John Barko.

Questions/Comments:

Mark Beorkrem asked about information on what has happened to aquatic plants lower on the system and impacts of navigation.

Dan Wilcox stated an exception is in pool 19 due to decreased depth, but that at other sites ambient suspended sediment concentrations simply limit distribution.

Mark Beorkrem asked if this would be addressed in the cumulative effects study.

Ken Barr stated that these existing ambient turbidity levels are part of the without project condition, and the study will not recommend mitigating these items.

Dan Wilcox stated that this information is discussed in the cumulative effects report on the sediment load analysis.

Jon Duyvejonck asked about getting information on pre-project turbidity.

Ken Barr stated that this cannot be done, since the data we collected includes tows.

John Barko stated that it may be possible to get some data during a future closure.

Bill Bertrand asked about the Illinois River.

John Barko stated that the Illinois River may need reduced depth in some areas to allow greater plant growth.

Jon Duyvejonck asked what the 10% and 90% sensitivity analyses showed.

Steve Bartell replied that simply to reduce the amount of data being provided in the packets they were not included. Steve summarized under the highest impact scenario some of the cells showed a 20-30% reduction. Steve stated that there was also some uncertainty related to the growth model, which were calibrated for similar latitudes, but not specifically the UMR.

John Barko stated that this should not change the analysis since this is related to the amount of sunlight, angle, temperature, etc.

Ken Barr stated that the study team is comfortable using the 50% values as the expected, but the team will continue to look at and consider the other runs as part of the sensitivity.

Bernie Schonhoff expressed some serious reservations on the methodology, particularly the flume study that examined wave effects. He was concerned over modeling estimates of flow, waves, angle of wave attack, and use of plants not adapted to flowing water conditions.

Dan Wilcox stated that the flume study finding showed impacts primarily related to breakage associated with leaves becoming tangled. Bernie clarified that he was particularly interested in how the Corps intends to highlight the uncertainties.

Ken Barr stated that the study team has been tracking all comments on the reports, will make those comments and uncertainty information available, and will consider these items in plan formulation and mitigation planning.

Ken Barr stated that for plants the greatest concerns are for pools 9,10,11, 13 and possibly 19. The study team will now specifically review these sites and determine potential ways to avoid, minimize, and mitigate. The team will also work to determine whether plants have ever existed in some of these areas. These efforts include gathering information on soils, etc. In response to a question regarding mitigation on the Illinois, Ken stated that plants do not exist in Peoria Lakes currently and are not likely and foreseeable. Gretchen clarified that the model does not track year to year changes. Ken stated that due to no identified impacts to tuber production and reproduction, he was not overly concerned with this limitation.

Mark Beorkrem stated that since the studies are being used to determine mitigation, he requested that reports be provided either electronically or in hardcopy to NGOs and others so that a full evaluation can be made.

Jon Duyvejonck would like to see field verification of model results. He also requested a further explanation of the extrapolation to the non-trend pools.

Steve Bartell explained that the impacts are being evaluated for every cell. He used the suspended sediment results to interpolate the results to the various plant cells. He used the information from the worst cells in the trend pools and applied it to the non-trend pools. He noted that in looking at the results you see a progressive reduction in production by pool based on increased ambient turbidity. So they did normalize the results from trend pools to non-trend pools. Steve did indicate that he may be able to actually run the model for the non-trend pools.

Mark Beorkrem asked if the approach used will be fully documented.

Steve Bartell said that it would.

Al Fenedick, EPA, **Bernie Schonhoff** and **Ken Brummet** had no additional comments.

Bill Bertrand would like to see the Illinois River looked at in terms of potential plant growth in the absence of tow traffic (i.e., examining the year that the system was shut down), and additional information on Pool 19 (Dan Wilcox stated that he is waiting to get some additional information from Richard Anderson).

Gretchen Benjamin stated that she would provide comments later.

Ken Barr stated that we want to hear from states on any areas of concern that we may have overlooked.

5. Mussels – Tom Keevin

Tom stated that we utilized two different approaches, laboratory studies and bio-energetic modeling. Both of these efforts showed little anticipated impact from tows on mussels. Tom added that currently we intend to use some of the continued planning, engineering, and design funds to validate these results with field studies at known mussel beds in the UMRS. This could be done as early as next year. The scope of this verification effort will be provided to the NECC when available.

Steve Bartell stated that again as discussed under the plant analysis he utilized output of the NAVSED model to look at potential impacts of increased suspended sediments. He noted that the primary concern is the dilution of organic carbon, decreasing the quality of the food for these organisms. The modeling was conducted using the three-ridge mussel. Steve stated that he is now looking at uncertainties regarding tow-type, flows, and bio-energetics parameters. He is also working with Dr. Drew Miller regarding whether or not changes need to be made in the bio-energetic parameters.

One factor leading to the minimal anticipated impacts is that mussel beds are often located between the main channel and near shore zone. This area shows relatively limited changes in suspended sediments due to tow passage. Steve highlighted that the greatest resuspension occurs immediately underneath and adjacent to tows in the main channel and in the near shore zone.

Questions/Comments:

Jon Duyvejonck expressed some concerns over the bio-energetics effects. He would like to see other biochemical parameters evaluated (e.g. glycogen, etc.). He wondered if these other indicators might show different results. Due to these concerns he is not ready to agree that there are no impacts on mussels. In general, he does agree with the results as they relate to suspended sediments.

Al Fenedick had no comments.

Bernie Schonhoff stated that he still has some concern over limitations associated with the model and zebra mussel impacts. Bernie recommended a statement in the packet, which indicated that incremental increases in tows would not have an effect on zebra mussel infestation, be softened to say “probably” not have much impact. **Tom Keevin** clarified that the Corps of Engineers is aware that tows are moving zebra mussels, but stated that we do not believe the incremental impacts are of concern.

Ken Brummet expressed concern over zebra mussels and the fleeting and waiting areas below lock 22. Ken stated that we want to have this information on specific sites.

Bill Bertrand stated that he has concern over zebra mussel infestation in association with fleeting areas, and that fleeting areas should not be located over existing mussel beds.

Gretchen Benjamin stated similar concerns over zebra mussels and was concerned that modeling was only done for three ridge mussels.

Mark Beorkrem stated that the EIS should reflect new concerns over zebra mussels. He also raised concerns over fleeting areas.

Ken Barr stated that we are looking at locations of fleeting areas and potential for increased use under a separate effort.

6. Fish – Steve Bartell

Steve stated that he would again focus his comments on uncertainties rather than the results. He stated that the fish results are different than plants and mussels. The fish study was not able to determine or assess specific locations of larval fish, so the analysis instead looked at entrainment potential for entire pools (based on average density, mixing, etc.). The sensitivity analysis looks at the effects of small variations in parameter values on model results. In total he looked at the implication of uncertainty of 130 model parameters. He reviewed information on channel catfish, paddlefish, and walleye in Pool 19 and sturgeon in pool 26a. The analysis uses a sensitivity index of 0-100 for the various parameters. For larval entrainment the key factors were vessel speed, entrainment volume, location of larva, and larval survival and density. For EAL, recruitment foregone, and production foregone sensitivity was more related to growth parameters and natural mortality. These analyses help to provide insight into variability and can help in mitigation planning (e.g. identify areas for further data gathering or types of impacts to minimize).

Questions/Comments:

Mark Beorkrem asked for further discussion on how the sensitivity helps evaluate limitations of data.

Steve Bartell stated that results will help determine which parameters are most critical and therefore point to additional data collection if necessary.

Mark Beorkrem also asked about the handling of adult fish entrainment impacts.

Tom Keevin stated that there is not enough information to determine what if any impacts would be expected. While one sample did show some entrained gizzard shad other efforts have indicated that adult fish get out of the way.

Bernie Schonhoff stated that some re-evaluation of the adult fish sampling methodology should be considered. He recommended something like a shad scoop for the adult fish sampling.

Ken Brummet recommended considering multi-level trawls to get more data.

Tom Keevin stated that a large number of experts were involved in selecting the original approach, and they expressed common concern over technical and safety issues.

Jon Duyvejonck requested that the NECC be involved before additional sampling would take place or an approach finalized.

Bill Bertrand asked if additional collection efforts were also being considered for larval fish densities.

Ken Barr stated that currently we are not planning to do additional work. As a result of the huge natural variability additional sampling is not likely to provide much better data.

Dan Wilcox pointed out that possibly a more important factor to investigate is survival rates.

Bill Bertrand stated that he believes the walleye and sauger results are not realistic, due to inadequate larval density data.

Tom Keevin reviewed the fish information that had been mailed out prior to the meeting. The packet provided the model outputs, which summarized the larval entrainment, EAL, RF, PF. He noted that a summary of commercial harvest data was also provided to help set the context. He then reviewed the pool by pool summaries of impacts.

Questions/Comments:

Mark Beorkrem questioned the variability in freshwater drum EAL numbers between pools, in particular a large drop-off below Pool 19.

Bernie Schonhoff pointed out similar variability with walleye, sauger, and bluegill.

Steve Bartell stated that this is generally due to the availability of larval data; some pools have a much greater level of detail due to power plant monitoring or other data sources.

Ken Brummet stated that larval fish density has very little to do with year class strength. Based on 20-30 years of data.

Tom Keevin pointed out that this is the best methodology and data available.

Dan Wilcox stated that survival rates are also a very important factor. He also added that it is important to remember that ichthyoplankton data is extremely variable in time and space, but the study approach used the best available method. The FWS and EPA have endorsed the approach.

Bill Bertrand is concerned with EAL, in that it only deals with first generation not losses over 50 years. The impacts could be greatly impacted over years due to lost future generations.

Dan Wilcox stated that the EAL model assumes population in equilibrium and as long as compensatory reserve is not overwhelmed the population will remain stable. Dan also pointed out that experts were consulted on the study design, but simply did not have enough information for a population model.

Ken Barr pointed out that there is about a doubling of impacts to fish in moving from alternative with just guidewalls to ones with locks. Ken stated that he sees that the study team will address annual losses through avoid & minimize and mitigation. This should allow for assumption of stable population. Steve Bartell also could do some simplistic fisheries population modeling.

Mark Cornish did look at population data in Pool 13, but found the existing information problematic.

Dan Wilcox stated that we may be able to back calculate some of the data.

Forage Fish - For pools 4, 8, 13, 26, and LaGrange, Steve looked at forage fish data in comparison to LTRM data. The two most impacted species were gizzard shad and emerald shiner. The overall effect was that the percentage losses are very low. Ken Barr summarized that we do not see any significant impacts to the forage fish. In contrast, Ken stated that he believes efforts on potential avoid, minimize and mitigation should focus on the commercial and recreational species. Ken requested the agencies to comment on forage fish impacts.

Questions/Comments:

Jon Duyvejonck stated that there is too much uncertainty to say for certain what is significant. He wants to see adaptive mitigation options left open, but he stated that his gut feeling is that impacts to forage fish are not significant.

Al Fenedick EPA had no comment.

Bernie Schonhoff had already stated his concerns, but was not willing to say whether forage fish impacts were significant or not.

Ken Brummet stated that we don't have adequate population data and this is the missing piece to determine significance.

Ken Barr stated that a reasoned choice amongst alternatives must be made.

Dan Wilcox stated that very little population data exists, but states still allow exploitation by commercial and recreational interests. The best we have is a comparison to what is already being done.

Jon Duyvejonck stated that we really don't know what the results will be on the fishery.

Ken Barr stated that the study team intends to go out and get 400 more samples of adult fish entrainment. We will also consider Iowa's concern over sampling of the water column during this effort. However, Ken stated that he believes a decision can and will need to be made with the data that is available.

Ken Brummet stated that in regards to forage fish the reproductive potential is great and populations are large. However, he wants to see more samples and added that Steve should delete pallid sturgeon impacts above the mouth of the Missouri River, since the species is not known to occur in that reach.

Bill Bertrand and *Gretchen Benjamin* stated that they were not concerned with forage fish impacts.

Commercial Fish - Tom Keevin reviewed the comparison of EAL to commercial harvest data. Tom Keevin recommended throwing out bowfin, due to the fact that much smaller impacts are anticipated than the modeling demonstrated.

Questions/Comments:

Bernie Schonhoff asked for clarification that the EAL numbers are related to just the increment of traffic, not including the without project traffic impacts as well (difference between with and without in 2020).

Jon Duyvejonck requested that future posting of results more clearly state what the numbers actually mean.

Rich Fristik summarized that the study team believes some of the commercial impacts are significant. He stated that potential mitigation could look into structural and non-structural items including woody debris, island construction, etc. Rich stated some of these might have multiple benefits.

Ken Barr stated that he would like comments on the significance of these impacts relative to the commercial harvest. Ken said that for mitigation the study team believes that which species are being impacted makes a difference (e.g more concern over catfish than carp).

Bernie Schonhoff stated that as impacts approach 10% of the commercial harvest it is becoming of concern.

Gretchen Benjamin added that if there are losses they will effect regulations of commercial harvest.

Jon Duyvejonck stated that he would defer to the fisheries biologists.

Ken Brummet stated that catfish and paddlefish are of greater concern.

Sports Fish – Ken stated that these include walleye/sauger, the basses , crappie, etc. He added that some effort was made to compare impacts with creel surveys, but that the data is limited and generally focused on specific backwaters or areas. It was pointed out that the UMRCC has some older data (1960s etc.). However, **Bill Bertrand** questions whether the data would be helpful based on its age. Bill added that he feels the walleye/sauger impact numbers seem understated.

Ken Barr stated that the study team has heard previous comments and will consider impacts to sport fish significant as appropriate.

Mark Cornish briefly reviewed a concept to provide fish passage at Lock 19. It was highlighted that it is a potential mitigation measure, but also could be done under other programs or restoration authorities, etc. The concept would utilize existing structures (old powerhouse foundation and old lock) as the basis for the fishway. The goal is to have a fish way with flows at or below 4 ft/s built on roughly a 30-1 slope. This type of improvement could potentially benefit a large number of the fish species under concern in the study. Mark highlighted that the base of the proposed fish way is a natural congregation area. Any construction would be done in partnerships with the dam owner Union Electric. It was highlighted that this structure is not subject to FERC licensing, which has lead to fish ways at some other sites. Mark stated that issues include the need to consider other systemic blockages, potential exotic species migration, downstream passage, cost, and whether or not it would work. The idea was developed in coordination with Bob Newberry and others from Canada.

Questions/Comments:

Ken Barr stated that the study team intends to pursue A&M and mitigation following a habitat-based approach rather than one which would stock fish.

Rich Fristik added that habitat mitigation options include items such as island creation, off-channel areas, woody structure, secondary channel restoration, and overwintering areas (dredging).

Ken Barr stated that he believes that access to habitat, such as fish passage presents mitigation opportunities as well.

Tom Keevin added that St. Louis District has been studying fish movement through the dams. Brian Johnson will be presenting results of the some monitoring work at the upcoming Midwest Fish and Wildlife Conference. Tom stated that there may be some operational options to expand the open river passage through the existing dams.

Ken Barr requested comments on each of the particular potential mitigation approaches: stocking, habitat, and fish passage.

Jon Duyvejonck stated that he prefers options other than stocking. However, it may be necessary to use stocking as a periodic response. He believes fish passage should be funded out of the O&M program rather than out of the Navigation Study. He would like to see options for fish passage in the overflow structures at some other lock. Fish passage at other locks could provide a test and likely would be a lot cheaper. He recommended a test before doing fish passage at Lock 19.

Ken Barr stated that Lock 19 is not part of the 9 foot channel project and will not be constructed using O&M funds. In addition, if it is not accomplished as mitigation it is likely to require a cost share. The LTRMP is currently proposing a planning exercise which will evaluate the operational and structural fish passage opportunities in the UMRS, it is currently listed as an over-target project (if funding available).

Rick Nelson asked if there should be a work group to evaluate fish passage options.

Al Fenedick stated that EPA wants to look at the array of possible alternatives prior to commenting on mitigation options.

Bernie Schonhoff stated that the Corps is 10 years too late in recommending fish passage. There are now greater concerns over exotic species. He also added that several of the key migratory species are maintaining themselves, at somewhat lower levels, without passage. In general, he does not support stocking as a mitigation strategy, but it may be needed periodically.

Ken Brummet stated that he has no great desire for stocking. He added that fish passage is not a big concern for Missouri, since Lock 19 is above the Iowa boarder. He is more concerned over the timing as to when the lower dams are open for fish passage. He favors habitat type mitigation, but stated that the design of revetments and other habitat needs to be looked at due to problems with these areas filling with sediment.

Bill Bertrand stated he was not against stocking for certain important species, but he is very interested in seeing options to restore off-channel habit, particularly on the Illinois. He expressed some concern over fish passage at lock 19, but felt this should continue to be investigated.

Gretchen Benjamin stated that she believes that for all locks and dams fish passage is already required. She added that habitat is preferred to fish stocking. She was also concerned over types of structures that might be created. She would like to see more natural approaches taken to restoration in place of rock structures.

Mark Beorkrem believes the major issue on the system is loss of habitat due to sedimentation and reduced floodplain function. As a result he stated that in considering mitigation the NECC needs to involve people other than fisheries biologists.

7. Bank Erosion – Kevin Landwehr

Kevin reviewed that the bank erosion effort started with a detailed survey of both rivers and that analysis then focused on evaluating the potential contributions by commercial tows. These areas of potential erosion were then related to the resources located on them (land cover/habitat, state listed and threatened species, islands, cultural, railroads, levees, etc.). In regards to threatening existing cultural sites, the study identified 11 sites on UMR 11-22 and 91 along the IWW that could be impacted. In addition to these known sites, work has also been done to evaluate potential sites (sites that based on the age and type of landform may have been occupied). Kevin highlighted that one of the key resources evaluated was islands. While islands only represented about 40% of potential erosion areas, they include over 70% of the unprotected areas. The types of A&M and mitigation measures under consideration include moving the sailing line, limiting vessel speeds, bioengineering, constructing revetment, placing riprap, and relocating mooring areas or providing mooring buoys/cells. In addition for severely eroded sites, further measures could include new island construction or adding on to existing islands and replacement of habitats.

Questions/Comments:

Ken Barr asked Kevin what the percentage of areas where commercial tows may be contributing to bank erosion. Kevin stated that of the overall area, bank erosion threatens .01% of the habitats. Ken stated that the general focus for A&M and mitigation would just be on areas of special concern. There was general discussion that bank erosion is a natural river process and in areas where it does not threaten important or rare resources is not of great concern.

Dan Wilcox stated that leaving some areas unprotected provides valuable cut banks and woody debris to the system.

Al Fenedick stated that a key factor is the quality of the resources that could be lost to erosion. In general, he sees the need for measures to address high quality areas.

Bill Bertrand recommended protection for cultural sites, mast trees, etc. But for sites with more abundant resource (e.g. silver maples), there is no reason to interfere.

Gretchen Benjamin agreed with Bill's comments and added that the State of Wisconsin does not want to see side spread use of rock armoring.

Jon Duyvejonck reiterated the need to look at key resources.

Bernie Schonhoff had no additional comments, and

Ken Brummet agreed that there is no need to protect areas naturally eroding if other resources are not in jeopardy.

8. Cumulative Impacts Report – Clint Beckert

Clint stated that the intent was to look at effects of commercial navigation and future resources. He reviewed the comments that were received and how they will be addressed. Addressing these comments will occur over the next 4-6 months. In total, roughly 300 comments were received. The team will address and/or respond to all comments. A large number were editorial comments, which will be incorporated as appropriate. Clint stated that the team does not plan to update or reformat figures reproduced from other but will reference appendices to the report which often present the information in a more legible form. The team will include items noted as missing (references, certain impacts not covered, sedimentation rate information, references to tributary dams, presence/absence of species, etc). They are working to include clarification on items such as the impacts of dams on sediment transport and river hydraulics, Chippewa River (sediment trap), detail regarding the aquatic areas classification system used, extrapolation of hydraulic models to other pools, and sediment budget issues. It may not be possible to resolve many of the conceptual issues in the remaining time frame since they go beyond the scope of the analysis (e.g. 2-d nature of study, reliance on professional judgement, limitation of study to aquatic areas).

Questions/Comments:

Jon Duyvejonck asked how this study will be used as a backdrop in assessing incremental increases in traffic. *Ken Barr* stated that the study team will compare backwaters and guilds identified in the report, with projected impacts of incremental increases in traffic. The study will serve as a qualitative reference. Ken Barr added that much of the cumulative effects report is being used in the Habitat Needs Assessment.

9. Next Meeting

The next meeting was scheduled for January 11-12, 2000. In addition, Ken stated that the study team will mail out estimates of mitigation as soon as available. This should occur sometime in mid-December.

Attendance List

NECC Meeting 3 November 1999

Holiday Inn, Moline, IL

Name	Affiliation	Address	Phone	E-mail
Richard Astrack	CEMVS-PM-N	1222 Spruce Street St. Louis, MO 63103-2833	(314) 331-8491	Richard.F+F38.Astrack@usace.army.mil
John Barko	CEWES-ES	3309 Halls Ferry Road Vicksburg, MS 39180-6199	(601) 634-3654	John.W.Barko@usace.army.mil
Ken Barr	CEMVR-PM-R	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5349	Kenneth.A.Barr@usace.army.mil
Steve Bartell	Cadmus Group	136 Mitchell Rd. Oak Ridge, TN 37830	(423) 425-0401	sbartell@cadmusgroup.com
Clint Beckert	CEMVR-ED-HQ	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5412	Clinton.A.Beckert@usace.army.mil
Mark Beorkrem	Sierra Club / MRBA	P.O. Box 370, 204 Wyandotte Morrisonville, IL 62546	(217) 526-4480	mbeorkrem@hotmail.com
Gretchen Benjamin	WI DNR	3550 Mormon Coulee Rd. La Crosse, WI 54601	(608) 785-9982	benjag@dnr.state.wi.us
Bill Bertrand	IL DNR	P.O. Box 149, 2106 Southeast Third Aledo, IL 61231	(309) 582-5611	dnrbpr@netins.net
Ken Brummett	MO DNR	Box 428 Hannibal, MO 63401	(573) 248-2530	brummk@mail.conservation.state.mo.us
Mark Cornish	CEMVR-PM-R	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5385	Mark.A.Cornish@usace.army.mil
Jon Duyvejonck	USFWS	4469 48th Ave. Ct. Rock Island, IL 61201	(309) 793-5800	Jon_Duyvejonck@fws.gov
Scott Estergard	CEMVR-PM-R	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5697	Scott.K.Estergard@usace.army.mil
Rich Fristik	CEMVR-PM-R	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5308	Richard.Fristik@usace.army.mil
Al Fenedick	USEPA	77 West Jackson Boulevard Chicago, IL 60604	(312) 886-6872	Fenedick.Al@epamail.epa.gov
Jim Hall	IA DOT/ GLC Rep	800 Lincoln Way Ames, IA 50010	(515) 239-1685	JHall@dnr.state.mn.us
Dan Johnson	CEMVR-ED-DN	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5857	Daniel.J.Johnson@usace.army.mil
Tom Keevin	CEMVS-PD-A	1222 Spruce Street St. Louis, MO 63103-2833	(314) 331-8462	Thomas.M.Keevin@usace.army.mil
Kevin Landwehr	CEMVR-ED-HH	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5578	Kevin.J.Landwehr@usace.army.mil
Marv Martins	CEMVR-ED-HH	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5222	Marv.R.Martens@usace.army.mil
Rick Moore	Isaac Walton League		(651) 649-1446	rxmoore@igc.org
Rick Nelson	USFWS	4469 48th Ave. Ct. Rock Island, IL 61201	(309) 793-5800	Rick_Nelson@fws.gov
Tom Pokrefke	CEWES-HR	3309 Halls Ferry Road Vicksburg, MS 39180-6199	(601) 634-2650	Thomas.J.Pokrefke@usace.army.mil
Rachel Streeter	CEMVR-ED-DG	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5561	Rachel.C.Streeter@usace.army.mil
Dave Tipple	CEMVR-PM-M	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5399	David.A.Tipple@usace.army.mil
Bernard Schonoff	IA DNR	3390 Hwy. 22 Muscatine, IA 52761	(319) 263-5062	fishiowa@muscanet.com
Jeff Stein	Am. Rivers	326 W 3rd St., Suite 714 Davenport, IA 52801	(319) 884-4481	JStein@amrivers.org
Brad Thompson	CEMVR-PM-M	P.O. Box 2004, Clock Tower Bldg. Rock Island, IL 61204-2004	(309) 794-5256	Bradley.E.Thompson@usace.army.mil
Lauri Walters	USFWS	4469 48th Ave. Ct. Rock Island, IL 61201	(309) 793-5800	Lauri_Walters@fws.gov
Dan Wilcox	CEMVP-PE-M	190 Fifth Street East St. Paul, MN 55101-1638	(612) 290-5276	Daniel.B.Wilcox@usace.army.mil