

Appendix 2

Conclusions and Recommendations of the International Red River Basin Task Force (TF) That Have Been Endorsed or Modified by the IJC

(TF Conclusions and Recommendations are in ordinary type)

(IJC comments or modified conclusions and recommendations are in italics)

Conclusions	IJC Endorsed	IJC Modified
<p>Red River in History</p> <p>TF 1. Analysis of the geological record, historic floods of the nineteenth century, statistics, and the hydrometeorological factors that cause floods in the Red River basin indicate that floods of the same size as in 1997, or even greater, can be expected in the future. (Page TF-19)</p> <p><i>IJC 1 - Although the 1997 flood was a rare event, floods of the same size as the 1997 event, or even greater, can be expected to occur in the future in the Red River basin. People and property remain at risk from these floods. (Page 20)</i></p>		✓
<p>Flow Management</p> <p>TF 2. It would be difficult if not impossible to develop enough economically and environmentally acceptable large reservoir storage to reduce substantially the flood peaks for major floods. (Page TF-24)</p> <p><i>IJC 2 - It would be difficult if not impossible to develop enough economically and environmentally acceptable large reservoir storage that alone would reduce substantially the flood peaks for major floods. Storage to reduce flood peaks for more frequent local floods may prove worthwhile and deserves further study. (Page 23)</i></p>		✓
<p>TF 3. Large-scale micro-storage has some potential to reduce flood peaks on the Red River but is likely to be impracticable and costly. There are many obstacles to its effective and efficient implementation. (Page TF-28)</p> <p><i>IJC 3 - Large-scale micro-storage has some potential to reduce flood peaks, perhaps significantly for more frequent local floods, but reliance solely on micro-storage for major flood events would be impracticable and costly. While there are many obstacles to its effective and efficient implementation, the feasibility of micro-storage for flood peak reduction should continue to be analyzed. (Page 24)</i></p>		✓

Conclusions continued	IJC Endorsed	IJC Modified
<p>TF 4. Wetland storage may be a valued component of the prairie ecosystem but it plays an insignificant hydrologic role in reducing peaks of large floods on the main stem of the Red River. (Page TF-30)</p> <p><i>IJC 4 - Wetland storage can provide an economically and environmentally beneficial method of reducing flood flows for frequent, smaller floods, but wetland storage alone is unlikely to significantly reduce the peaks of large floods on the main stem of the Red River. (Page 25)</i></p>		✓
<p>TF 5. There may be many good environmental and other reasons to restore wetlands, but wetland restoration is an economically inefficient method of reducing flood damages for infrequent large floods, like the Red River flood of 1997. (Page TF-30)</p> <p><i>IJC - See IJC Conclusion 4 above.</i></p>		✓
<p>Winnipeg at Risk</p> <p>TF 6. Under flow conditions similar to those experienced in 1997, the risk of a failure of Winnipeg's flood protection infrastructure is high. (Page TF-44)</p> <p><i>IJC 5 - Under flow conditions similar to those experienced in 1997, the risk of a failure of Winnipeg's flood protection infrastructure is high. Public safety requires that the city, province and Canadian federal government focus immediate attention on designing and implementing measures to further protect Winnipeg. (Page 29)</i></p>		✓
<p>Lower Pembina River Flooding</p> <p>TF 7. There is general recognition in the region that flooding in the lower Pembina River basin has been profoundly affected by the construction of dikes and of roads that act as dikes on both sides of the boundary. Rectifying the transboundary flooding consequences of these structures will require action in both countries and there appears to be a general readiness to take such action. (Page TF-84)</p> <p><i>IJC - The Commission endorses this conclusion but does not restate it.</i></p>	✓	
<p>Data and Decision Support for Flood Management</p> <p>TF 8. Further improvement and maintenance of the Red River floodplain management database is required. Federal, state and provincial governments and local authorities must maintain a high level of involvement in further database development and in improving data accessibility. (Page TF-94)</p> <p><i>IJC 6 - The Commission endorses this conclusion and restates it. (Page 53)</i></p>	✓	
<p>Flood Related Institutional Arrangements</p> <p>TF 9. It is, of course, for the Commission and the governments to ratify an international watershed board for the Red River basin. The Task Force, however, considers that such a board, if established, might appropriately be assigned a mandate to advocate and report on flood-related issues, including the progress of governments in implementing the recommendations in this report and in maintaining and advancing the work of the Task Force's legacy projects. More particularly, this mandate could include the flood-related functions identified earlier in this section, namely:</p>		✓

Conclusions continued	IJC Endorsed	IJC Modified
<p>(i) Ensure ongoing institutional support and full multi-jurisdictional participation for legacy projects, the distributed data base, and computer models.</p> <p>(ii) Monitor implementation of recommendations designed to ensure basin-wide flood preparedness and community resiliency.</p> <p>(iii) Monitor and report on the implications of specific flood-related recommendations.</p> <p>(iv) Promote a culture of flood preparedness and flood resiliency in the basin.</p> <p>(v) Support of early warnings and early action in the face of impending major floods.</p> <p>(vi) Ensure coordination of flood forecasting information.</p> <p>(vii) Provide a forum for multi-jurisdictional problem solving.</p> <p>(viii) Provide a forum for the exchange of best-practices information.</p> <p>(ix) Provide knowledgeable and credible advocates to interact with the highest levels of government in order to make decision makers aware of the requirements of the people of the basin on flood-related issues and associated issues of water management. (Page TF-126)</p> <p><i>IJC - Restated as IJC Recommendations 26 and 27. (Pages 62 and 65)</i></p>		

Recommendations	IJC Endorsed	IJC Modified
<p>Flow Management</p> <p>TF 1. Wetland restoration projects for flood control should be evaluated on the basis of their local benefits and costs rather than imputing a basin-wide benefit. (Page TF-30)</p> <p><i>IJC - See IJC Conclusion 4. The Commission concludes that wetland storage can provide an economically and environmentally beneficial method of reducing flood flows for frequent, smaller floods, but wetland storage alone is unlikely to significantly reduce peaks of large floods on the mainstem of the Red River. (Page 25)</i></p>		✓
<p>TF 2. Future ice jam information from the entire basin should be incorporated into the CRREL Ice Jam Database so that ice problems in the basin can be analyzed further. Where feasible, historic ice jams from the Canadian portion of the basin should be entered. (Page T-34)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>Communities at Risk</p> <p>TF 3. Communities in the United States portion of the Red River basin should ensure that community-built flood damage reduction projects are certified by FEMA for 100-year or greater protection, or should participate in the Non-Federal Flood Control Works Inspection Program. (Page TF-37)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	

Recommendations continued	IJC Endorsed	IJC Modified
<p>Winnipeg at Risk</p> <p>TF 4. The design flood used as the standard for flood protection works for Winnipeg should be the highest that can be economically justified or, at a minimum, the flood of record, the 1826 flood. (Page TF-46)</p> <p><i>IJC 2 - The Commission endorses this recommendation and restates it. (Page 29)</i></p>	✓	
<p>TF 5. Based on results from hydraulic model studies, modify the east embankment of the Floodway to improve the performance of the Floodway entrance to lower upstream water levels and increase capacity. (Page TF-52)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 6. The west dike should be raised to allow a water level elevation of 778 feet at the Floodway inlet structure with appropriate freeboard. (Page TF-53)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 7. The primary diking system should be raised where economically feasible to the elevation specified in existing legislation. (Page TF-53)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 8. The City of Winnipeg, the Province, and the federal government should cooperatively finance detailed feasibility studies of the two major projects that would protect Winnipeg against very large floods. (Page TF- 53)</p> <p><i>IJC 3 - The city, province and the Canadian federal government should cooperatively develop and finance a long-term flood protection plan for the city that fully considers all social, environmental and human effects of any proposed flood protection measures and respects both the needs of Winnipeg and the interests of those outside the city who might be affected by such a plan. (Page 31)</i></p>		✓
<p>TF 9. The three jurisdictions should work towards a Winnipeg Protection Agreement to finance the development of a long-term protection plan that would include construction of the Ste. Agathe Detention Structure or Floodway expansion. (Page TF-53)</p> <p><i>IJC - See IJC Recommendation 3 above.</i></p>		✓
<p>TF 10. Modifications to the sewer and land drainage systems should be optimized and undertaken once the overall plan for Winnipeg flood protection is determined. (Page TF-53)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 11. The City of Winnipeg should give immediate high priority to the preparation of a detailed emergency preparedness and response manual. (Page TF-54)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	

Recommendations continued	IJC Endorsed	IJC Modified
<p>TF 12. Operating rules for new flood control measures should be designed to accommodate all flow regimes, even those beyond design capacity. The public should be consulted on any proposed new operating rules. (Page TF- 54)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>Flood Preparedness and Resiliency</p> <p>TF 13. In the U.S. portion of the Red River basin, the 100-year floodplain should continue to be defined in light of the best available information and the revised flood elevations should be used as the basis for floodplain regulations. (Page TF-58)</p> <p><i>IJC 13 - Governments should use, at a minimum, the 100-year (one-percent) flood as the basis for floodplain regulations and revise their estimates of the 100-year flood levels based on 1997 and new data that become available. (Page 43)</i></p>		✓
<p>TF 14. In Manitoba, either the flood of record or the one-percent flood should be used for Red River basin regulations. (Page TF-58)</p> <p><i>IJC - See IJC recommendation 13 above.</i></p>		✓
<p>TF 15. The 500-year flood (0.2 percent flood) should be defined throughout the Red River basin and used to inform the public of the potential risks of flooding from rare events, including the need to buy flood insurance in the United States, and as the basis of regulations for siting and floodproofing critical facilities. (Page TF-58)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 16. Both North Dakota and Minnesota should consider adopting the new International Building Code that includes requirements for design and construction in flood hazard areas. (Page TF-59)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 17. The National Building Code of Canada should specify design and construction standards for buildings in flood hazard areas such as the Red River basin. Floodplain construction requirements should be incorporated into the Manitoba code when available. (Page TF-59)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 18. Federal, State, provincial and local governments in the Red River Basin, in conjunction with the private sector, should continue to develop, refine and implement effective strategies to improve the disaster resiliency in both communities. Efforts should be made to increase public awareness of flood risks throughout the basin. (Page TF-60)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 19. State, provincial and other appropriate authorities should review the effectiveness of and compliance with the floodplain management regulations in the basin and take steps as needed to improve enforcement. (Page TF-61)</p> <p><i>IJC 14 - The Commission endorses this recommendation and restates it. (Page 44)</i></p>	✓	

Recommendations continued	IJC Endorsed	IJC Modified
<p>TF 20. While the restriction of reuse of acquired properties is prudent as applied to residential, commercial or other non-flood damage mitigation purposes, FEMA should revise its interpretation of “structures” under the Hazard Mitigation Grant Program regulations to exempt water level control devices, dikes, levees, flood walls and any other feature that would mitigate future flood losses. (Page TF-61)</p> <p><i>IJC - The Commission notes that FEMA and the U.S. Army Corps of Engineers signed a Memorandum of Understanding regarding this issue on March 29, 2000; thus, the Commission believes there is no need for further comment. (Page 44)</i></p>		
<p>TF 21. The Canadian federal government should include in the Disaster Financial Assistance Arrangements provisions to allow for the permanent removal of structures in areas subject to repeated flooding. (Page TF- 61)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 22. FEMA and Emergency Preparedness Canada should develop an integrated approach to mitigation initiatives at all political levels based on a comprehensive mitigation strategy for the entire basin. In the United States, the strategy should be integrated within the National Mitigation Strategy. (Page TF-62)</p> <p><i>IJC 11 - Governments should develop a binational integrated approach to mitigation initiatives at all political levels, based on a comprehensive mitigation strategy for the entire basin. In the United States, the strategy should be integrated within the overall national framework. (Page 42)</i></p>		✓
<p>TF 23. The Canadian federal government should establish a national flood mitigation strategy, or a broader disaster mitigation strategy, and support it with comprehensive mitigation programs. (Page TF-63)</p> <p><i>IJC 12 - The Commission endorses this recommendation and restates it. (Page 42)</i></p>	✓	
<p>TF 24. In the U. S. portion of the Red River basin, FEMA should expand current efforts to market the sale and retention of flood insurance both within and outside the 100-year floodplain. Innovative marketing should be considered to attract and retain policy holders, including increasing the waiting period from 30 days to 60 days before flood insurance comes into effect. (Page TF-65)</p> <p><i>IJC - The Commission supports measures that will increase the purchase and retention of flood insurance in the U.S. portion of the basin. The Commission understands that FEMA is reviewing the length of the qualification period and suggests that it consider Red River basin experiences within its larger, national review. (Page 45)</i></p>		✓
<p>TF 25. Recovery, rebuilding, and mitigation expertise and information should be widely shared across the border in advance of flooding. (Page TF-65)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	

Recommendations continued	IJC Endorsed	IJC Modified
<p>TF 26. Measures of flood resilience should be developed, and a system should be established to monitor resilience in the Red River basin. (Page TF-66)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>Flooding in the Lower Pembina River</p> <p>TF 27. The International Technical Working Group, formed in 1996 but currently inactive, should be re- activated to examine the findings of the hydrodynamic model. Working with local interests, such as the Pembina River Basin Advisory Board, it should develop, implement, and fund a solution that is sustainable in the long term. (Page TF-84)</p> <p><i>IJC 10 - Federal government agencies, in cooperation with the state of North Dakota and the province of Manitoba, should establish a consultative group to work with local interests, including the Pembina River Basin Advisory Board, to resolve the lower Pembina River flooding issue, provide the necessary resources for the group, and act to achieve a solution. (Page 41)</i></p>		✓
<p>TF 28. Given the transboundary nature of the basin and the potential for federal involvement in funding and monitoring any agreement, federal agencies from both countries should be engaged in this process as well. (Page TF-84)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 29. Changes in the road network and diking system in the Lower Pembina Basin should be modeled by the hydrodynamic model prior to implementation of any plan to ensure that there are no unintended consequences. (Page TF-84)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 30. The virtual database and decision support system prototype that the Task Force has begun to develop for the Pembina Basin should be continued by relevant agencies in Canada and the United States. (Page TF-84)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>Hydraulic Connections at Lake Traverse</p> <p>TF 31. Engineering studies should be immediately undertaken to examine all means of eliminating the potential for the hydraulic inter-basin connection in the vicinity of Browns Valley. Governments should then implement the most feasible option. During the interim, the Little Minnesota River system should be closely monitored for undesirable species. If such species appear, immediate action should be taken to prevent their transfer to the Red River basin.</p> <p>Since benefits accrue basin-wide from coordinated actions taken to prevent the movement of non-native species between adjacent basins, local governments should not be held responsible for costs associated with monitoring or implementing corrective measures. While the U.S. Army Corps of Engineers will need to take the lead role in implementing this recommendation, cost-sharing options should be negotiated with Canada because of the basin-wide benefits. (Page TF-88)</p>		✓

Recommendations continued	IJC Endorsed	IJC Modified
<p><i>IJC - The Commission supports the need for studies to examine means of eliminating hydraulic inter-basin connections and the need for biological monitoring to identify invasive species that may create a risk to the aquatic environment. If such monitoring were to indicate the potential for transfer of species across the divide, the Commission would encourage immediate action to prevent such transfer. (Page 57)</i></p>		
<p>TF 32. Any modification to existing operating plans or physical structures associated with Lake Traverse that could increase pool elevation must be accompanied by features that eliminate the southward movement of water into the Little Minnesota River. (Page TF-88)</p> <p><i>IJC - The Commission endorses the recommendation that any modifications to operating plans or structures associated with Lake Traverse must include consideration of their potential to increase the possibility of interbasin transfers. (Page 57)</i></p>	✓	
<p>Lake Winnipeg Water Quality</p> <p>TF 33. Governments should take immediate steps to ensure that all banned materials such as toxaphene are removed from storage areas in the Red River basin and that potentially hazardous materials are not stored in the 500-year floodplain. Reasonable quantities of such substances could be maintained in the floodplain for immediate use. (Page TF-91)</p> <p><i>IJC 23 - Governments should take immediate steps to ensure that all banned materials such as toxaphene are removed from the Red River basin. Governments should also ensure that potentially hazardous materials are not stored in the 500-year floodplain, although reasonable quantities of such substances could be maintained in the floodplain for immediate use. (Page 57)</i></p>		✓
<p>TF 34. Governments should continue to monitor toxaphene in the Lake Winnipeg ecosystem until concentrations decline to pre-1997 levels. (Page TF-91)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>Data and Decision Support for Flood Management</p> <p>TF 35. Hydrometric and meteorological data networks necessary for flood forecasting should be improved and maintained in a state of readiness to forecast future floods. (Page TF-95)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 36. New geographically related data collection in the United States should be in accord with the North American Vertical Datum of 1988. (Page TF-95)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 37. For consistency and accuracy data used in models should take into account the differences in data at the border. Because datum conversions can affect data accuracy, any conversions between standards should be noted and reported along with the data. (Page TF-96)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	

Recommendations continued	IJC Endorsed	IJC Modified
<p>TF 38. U.S. National Geodetic Survey and the Geodetic Survey of Canada should convene a forum of datum experts in the year 2000 to discuss Red River Basin datum issues and develop a long-term transition plan. (Page TF-96)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 39. All key data providers in Canada should make available at no cost and with no restriction the data sets necessary for the Red River floodplain management and emergency response, and regional or basin-wide modeling activities. (Page TF-97)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 40. Data providers should remain responsible for maintaining and replicating the data sets. (Page TF-97)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 41. Development of the digital elevation model for the Red River Basin should be completed by collaborative initiatives of the relevant agencies. (Page TF-101)</p> <p><i>IJC 16 - Development of the digital elevation model for the Red River basin, with high resolution in appropriate high flood risk areas, should be pursued and completed through collaborative initiatives of federal, state, provincial and local governments. (Page 48)</i></p>		✓
<p>TF 42. Relevant federal, provincial, state agencies and transboundary agencies should meet to determine the interest in continuing the work of RRBDIN and if there is agreement to continue it, draw up a funding and action plan to ensure its continuation. (Page TF-103)</p> <p><i>IJC 21 - Governments should ensure that progress continues in building a binational, virtual network linking the people, data, and models for the Red River basin. (Page 53)</i></p> <p><i>IJC 22 - Federal, state, and provincial governments should work with basin organizations to complete in a timely manner the development of a prototype decision-support system and establish a cooperative mechanism for coordination and funding its further development and implementation. (Page 53)</i></p>		✓
<p>TF 43. A decision on whether to continue operation of the Virtual Forum should be included in the discussions on the continuation of the RRBDIN. (Page TF-104)</p> <p><i>IJC - The Task Force and GDIN also jointly sponsored “virtual forums”: online networking and information sessions. This work should continue beyond the end of the Task Force’s mandate. (Page 52)</i></p>		✓
<p>Hydrologic and Hydraulic Modeling</p> <p>TF 44. The U.S. National Weather Service should implement its Advanced Hydrologic Prediction System in the Red River basin as an early priority. (Page TF-107)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	

Recommendations continued	IJC Endorsed	IJC Modified
<p>TF 45. A binational Red River Flood Forecasting Liaison Committee should be established by government to improve communications among forecasters and with the public. (Page TF-108)</p> <p><i>IJC 18 - The governments should authorize the Commission to establish a binational Red River Flood Forecasting Liaison Committee under the International Red River Board to improve interjurisdictional coordination and to help ensure that clear, understandable and compatible forecasts are issued to the public. (Page 50)</i></p>		✓
<p>TF 46. Confirm the flood peak reduction findings of Chapter 3 for large floods and examine reductions for smaller floods by implementing distributed models on tributaries such as the Mistinka, Wild Rice and Maple Rivers. (Page TF-110)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 47. As a long-term priority for government and academic research, implement a basin-wide coupled atmospheric–hydrologic model in the Red River basin. (Page TF-110)</p> <p><i>IJC 19 - As a long-term priority, government agencies responsible for flood forecasting and mitigation measures should develop basin-wide models rather than separate but coordinated models for each country. (Page 51)</i></p>		✓
<p>TF 48. Conduct surveys of secondary roads, particularly in the central portion of the basin, with differential global positioning systems, and incorporate the results into the hydraulic models. (Page TF-115)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it.</i></p>	✓	
<p>TF 49. The U.S. Army Corps of Engineers and Manitoba Conservation, operators of the UNET and MIKE 11 models respectively, should maintain the existing models and continue to seek improvements through collaboration with other agencies. (Page TF-116)</p> <p><i>IJC - The Commission endorses this recommendation in the short-term, but makes IJC Recommendation 19 as a long-term priority. (Page 51)</i></p>		✓
<p>TF 50. Measures should be taken to ensure that data supporting the operation of the hydraulic models and model outputs can be made widely available. (Page TF-116)</p> <p><i>IJC - The Commission endorses this recommendation but does not restate it; see also IJC Recommendation 20. (Page 52)</i></p>	✓	
<p>Flood-Related Institutional Arrangement</p> <p>TF 51. If the International Joint Commission pursues the watershed board concept, the Commission should consider establishing its initial board in the Red River Basin and assigning to this board the flood-related responsibilities outlined above. (Page TF-127)</p> <p><i>IJC - See IJC Recommendations 27 and 28. (Pages 65 and 66)</i></p>		✓