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International Souris River Board  
Virtual Meeting  
March 24, 2022

**Final Minutes**

**Board Members in attendance:** Nicole Armstrong, Andrea Travnicek, John-Mark Davies, David Ashley, Scott Gangl, Debbie McMechan, Mark Lee, Col. Karl Jansen, Tom Pabian, David Pattyson, Jeff Woodward, Shelly Wepler, Gregg Wiche, Russell Boals, Joe Goodwill

**Board Member Regrets:** David Glatt, Lorinda Haman

IJC Advisors: Mark Gabriel, Rob Caldwell

Support Staff and Participants: Mitch Weier (USACE/U.S. co-chair FFLC), Kyle Flanery (USFWS), Scott Jutila (USACE), Ken Bottle (USFWS/U.S. co-chair COH), Rebecca Seal-Soileau (USACE), Bruce Davison (ECCC), Chris Korkowski (NDDWR), Gary Williams (USFWS), Laura Ackerman (NDDWR/ISRB U.S. co-secretary), Eric Dude (U.S. Dept of Interior), Girma Sahlu (ECCC/ISRB Canada co-secretary), Heather Husband (NDDEQ/U.S. co-chair AEHC), Martin Grajczyk (WSA/Canada co-chair COH).

1. Introduction and Opening Remarks

Nicole Armstrong, Canadian Co-Chair, opened the meeting at 2:02 p.m. CDT. N. Armstrong also reminded participants that the meeting will be recorded and asked attendees to sign in as they join the virtual meeting.

2. Approval of Agenda

The agenda was approved as circulated.

**Motion:** David Ashley moved to accept the agenda. David Pattyson seconded the motion.  
**Carried.**

### 3. Severe Drought Criteria Presentation

Laura Ackerman provided a presentation (Attachment 1) on the history of the Severe Drought Criteria (SDC). Girma Sahlu and L. Ackerman researched the history of this subject following an action item from a special meeting of the Board on September 2, 2021. It was explained the SDC is relevant to the Interim Measure at Westhope, which provides that North Dakota will provide Manitoba with 6,069 ac-ft (7,486 dam<sup>3</sup>) of water at the Westhope International Crossing from June 1<sup>st</sup> to October 31<sup>st</sup> at a minimum flow rate of 20 ft<sup>3</sup>/s (0.57 m<sup>3</sup>/s). The interim measure also provides an exception for this flow requirement in periods of severe drought.

The SDC stipulates that severe drought conditions exist when the aggregate storage in Lake Darling and the five pools of J. Clark Salyer National Wildlife Refuge is 54,000 ac-ft (66,608 dam<sup>3</sup>). It is the responsibility of the U.S. to provide the earliest possible advice concerning the onset of severe drought. If the SDC is implemented, the Board is responsible for deciding the size of a practicable release taking into account general hydrologic conditions and the objective of making water available for human and livestock consumption and for household use.

In 1960, the Souris River Board of Control (precursor to current Board) approved SDC on a tentative basis. This version of the SDC took into account the storage in Lake Darling, water levels of the J. Clark Salyer pools, along with tributary inflow in North Dakota.

In 1962 and 1963, the Board considered further revisions to the SDC that accounted for the following items:

- Transmission losses from Lake Darling to J. Clark Salyer
- Losses if a disproportionate amount of storage is in Lake Darling
- Elimination of ambiguity between individual reservoir levels and aggregate storage

On May 7, 1963, the Board approved the SDC that is currently in effect. The minutes from that meeting state that the SDC was approved “with the understanding that they will be reviewed from time to time as indicated by future storage developments or other pertinent consideration.”

At the February 9, 1989 Board meeting, the USFWS presented a proposal to review the criteria. They recommended limiting flows to Manitoba based on the amount of flow available to North Dakota – Sherwood flows plus the natural flow in the state. At the following winter Board meeting, on February 9, 1990, a member for Canada stated that Manitoba gave up its claim to a percentage of the flow in exchange for a regulated stable flow, and that this was the intention of the interim measure. Following an action item from the Board to research the rationale of the SDC volume trigger, a 1961 memo was discussed at a May 22, 1990 meeting. The 1961 memo suggested that the storage volume was set to provide one year’s supply to North Dakota’s users plus 10 ft<sup>3</sup>/s (0.28 m<sup>3</sup>/s) to Manitoba.

In 1996, the Natural Flow Methods Committee (precursor to current Committee on Hydrology) investigated questions from the Board on how revised area-capacity table for USFWS refuge pools and revised apportionment procedures at Sherwood would affect the SDC. The committee found that Rafferty and Alameda (now Grant Devine) operation would increase frequency of severe drought at Westhope from 14% to 20% of the modeled years. They determined that the updated curves had no impact.

At that time, the Natural Flow Methods Committee proposed three options for addressing the increase in frequency of severe drought. Each of the options was strongly opposed by one or more of the impacted entities. These options were as follows:



- Reduce combined refuge volume to volume that would occur in 14% of years as opposed to 20% of years
- Leave SDC volume trigger the same, and have Saskatchewan make additional releases that North Dakota passes to Manitoba
- No change. Manitoba accepts risk of increased frequency

At a Board meeting on February 11, 1997, the USFWS and U.S. co-secretary presented a joint report on the SDC with respect to the establishment of the minimum elevations of the refuge pools. Their research found that the minimum refuge pool elevations were selected on a flow loss analysis basis rather than on a biological basis. In other words, the elevations chosen for J. Clark Salyer pools would help ensure that the water released would reach Manitoba. The minutes from that meeting also state that no resolution was reached on the issue and no further steps would be taken until the next severe drought occurs.

The presentation ended with a review of the most recent drought and special Board meeting on September 2, 2021. Based on the research for this meeting, it was found that the Board has discussed the SDC several times and concerns seem to remain unresolved.

#### 4. Questions and Discussion on Next Steps

Mark Lee, Manitoba Environment, Climate and Parks, asked what happened in 2007 and 2008, as those were dry years. L. Ackerman stated that when conducting the research, they were able to target certain years to construct a timeline, but not all years.

**Action:** Co-secretaries research what happened in 2007 and 2008 relative to SDC.

Kyle Flanery, USFWS, asked why all the interim measures, including the SDC, are not included in the 1989 Agreement. Jeff Woodward, WSA, offered that the 1989 Agreement is relative to water sharing between Saskatchewan and North Dakota, while the Westhope Interim Measure is a separate agreement between Manitoba and North Dakota. Ken Bottle, USFWS, stated that the interim measures came out first to outline water sharing between the countries, and the 1989 Agreement came later, which provided more detail on certain aspects of water management of the Souris River.

For next steps, K. Bottle viewed the approach as both long-term and short-term. Over the short-term, the focus should be on what recommendations can we make now if it continues to be a dry year. He outlined a number of tasks that may be beneficial, such as a survey of J. Clark Salyer pools, reviewing the area-capacity curve for Lake Darling, and understanding the current water uses in Manitoba. Nicole A. added that she would be interested in the reconstructed natural flows at the border. M. Lee stated the effect of J. Clark Salyer on water quality in Manitoba was brought up during the International Souris River Study.

Chris Korkowski, NDDWR, mentioned an analysis that he and Gregg Wiche conducted. The analysis evaluated where the volume to meet (?) the Westhope Interim Measure was coming from. They found that in a substantial number of years, the volume required at Westhope is provided by flow downstream of Lake Darling.

**Action:** NDDWR provide analysis memo to COH.

Gregg Wiche stated that it would be helpful if the research discussed at this meeting was put into a report.

**Action:** Co-secretaries to create a report on SDC research.

There was more discussion about what is best for the basin in a severe drought. K. Bottle added that he liked the idea of one basin, one hydrology, with both provinces and North Dakota included in one combined plan.

M. Lee mentioned one aspect to review is losses, since it seems like a large amount was lost to the channel and evaporation. The basis for the timing of the flow from June to October is not clear. He added that some municipal water supply in Manitoba is now coming from groundwater, so there is less municipal demand on surface water than in the 1960s.

J. Woodward asked if the USFWS was considering moving water now from Lake Darling to J. Clark Salyer. K. Flanery responded that the Eaton Irrigation Dam between the two refuges is closed to capture runoff. Per agreement between the USFWS and Eaton Irrigation, the gates may stay closed until July 15<sup>th</sup>. The irrigation district is entitled to capture up to 10,000 ac-ft (12, 335 dam<sup>3</sup>) or lesser amount of spring runoff that enters Lake Darling. Tributary runoff below Lake Darling can also be captured by the irrigation district to help make up that volume.

There was discussion on if the Board must decide a lesser amount to be delivered to Manitoba, it would be beneficial to know the needs. R. Boals added that the flows to be delivered to Manitoba need to account for social-economic concerns. This is more than just a process of crunching numbers. R. Boals recalled a time in the 1990s when the Board implemented an alternative flow schedule and part of the discussion was the social-economic considerations. L. Ackerman provided the Board's decision in 1993 as the following:

- 0.28 m<sup>3</sup>/s (10ft<sup>3</sup>/s) during June to top off all in-stream reservoirs
- No release during July and August
- 0.71 m<sup>3</sup>/s (25 ft<sup>3</sup>/s) during September and October to refill reservoirs in preparation for winter

There was further discussion on how impacts are relative. Debbie McMechan added there was not enough water to pump from the river to dugouts last year. At times last year, there was no flow at Wawanesa. N. Armstrong stated there were reports of fish kills. K. Flanery stated the SDC does not seem to consider the migratory bird and fishery (biological) aspect.

With respect to next steps, it was decided that the COH should proceed with their review of the SDC (already an action item). The review should consider a short-term recommendation if the need arises for the Board to decide a lesser amount to be delivered to Manitoba. It was also recommended that the COH consider a long-term analysis that reviews the SDC and bring forth any recommended changes to the Board. Andrea Travnicek, U.S. Co-Chair, directed the COH to consult with the appropriate people to help with their review.

## 5. June Meeting

There was discussion about the dates and location of the Board and public meetings in June.

**Action:** Co-secretaries send meeting invitation to Board and participants for a public meeting on June 14<sup>th</sup> and Board meeting on June 15<sup>th</sup>.

**Action:** N. Armstrong will talk to the Canadian Board members for feedback on meeting location and tour ideas.

#### 6. Discussion on IJC Governance Review

N. Armstrong stated that she and A. Travnicek had discussed this issue in light of the last Board meeting. It was acknowledged that concerns were expressed by Board members at the last meeting with respect to the IJC's governance review. The Co-Chairs suggested that instead of focusing on criticisms over the restructuring, they ask the IJC to pause their work and allow the current Board an opportunity to address the challenges identified by the IJC. Several Board members voiced their support of the suggested path forward. No objections were raised.

**Action:** Co-chairs and co-secretaries to update the Board's presentation for the IJC's semi-annual with the suggested path forward and recirculate to the Board.

#### 7. Adjournment

The meeting was adjourned at 3:35 p.m. CDT.

**International Souris River Board**  
**ACTION ITEMS – progress updated May 13, 2022**

<b>PERSONS OR COMMITTEE RESPONSIBLE</b>	<b>TOPIC</b>	<b>MINUTE</b>	<b>ACTION</b>	<b>STATUS AS OF May 13, 2022</b>
COH and COC	Coordinate and determine infographics for the Souris	26-Jun-19 Updated 23-Jun-21	COH and COC coordinate and determine the necessity of generating a Souris Basin Hydrology Infographic and generate an IWI Proposal if deemed necessary.	Ongoing
USFWS	Monthly updates	22-Jun-21	USFWS provide monthly updates to the ISRB on ability to maintain 20 cfs (0.57 cms) to Manitoba.	Complete for 2021; keep as ongoing (added to work plan)
FFLC & Russell Boals	Review Terms of Reference (ToR)	22-Jun-21	Review ToR to ensure the responsibility for assessing the need for additional determinations of natural flow and the status of apportionment, as well as responsibilities during non-flood operations, are clearly stated.	Ongoing (Hold, pending governance review)
FFLC & Russell Boals	Develop flow chart	22-Jun-21	Develop a flow chart of the process for identifying and managing requests for determinations of natural flow, the status of apportionment, and management of delayed releases.	Ongoing
COH & Russell Boals	Review Terms of Reference (ToR) <i>Note: specified as priority for COH at 22-Jun-21 meeting</i>	22-Jun-21	Review and update ToR, considering the need for more frequent interim calculations of natural flow during low flow years. Also ensure that the ToR is consistent with that of the FFLC.	Ongoing (Hold, pending governance review)

**International Souris River Board**  
**ACTION ITEMS – progress updated May 13, 2022**

COH	Tasks related to development of automated apportionment  <i>Note: specified as priority for COH at 22-Jun-21 meeting</i>	22-Jun-21	a. Develop estimation methodology for 3 <sup>rd</sup> party data b. Identify and conduct validation testing methods c. Investigate potential for IWI project and prepare proposal for development of a python script and user-friendly front end to calculate apportionment	Ongoing
COH	Tasks related to Natural Flow Procedure Manual  <i>Note: specified as priority for COH at 22-Jun-21 meeting</i>	22-Jun-21	a. Update procedure manual documentation b. Evaluate natural flow determination procedures c. Develop concise documentation of the present procedures used in calculating apportionment	Ongoing
COH	Rounding in natural flow calculation spreadsheet	22-Jun-21	Review rounding in the natural flow calculation spreadsheet that produces the U.S.'s share (Box 45).	Ongoing
COH	Severe Drought Criteria	22-Jun-21	Review the Severe Drought Criteria with respect to required border flows and make recommendations to the ISRB	Ongoing
COH	Estimates for diversions by minor projects	22-Jun-21	Review and recommend procedures for estimating diversions by minor projects	Ongoing
ISRB co-chairs	Membership list for Communications and Outreach Committee (COC)	23-Jun-21	Draft membership list for the COC to be considered at the Winter 2022 meeting	Ongoing (Hold, pending governance review)
ISRB co-secretaries	Regular update on Canadian Dams	23-Jun-21	Add Canadian Dam update as a regular update under the Water Management Project agenda item	Complete for winter 2022 meeting; keep as ongoing (added to work plan)

**International Souris River Board**  
**ACTION ITEMS – progress updated May 13, 2022**

ISRB co-secretaries	Compile drought-related documents	2-Sept-22 Updated 24-Mar-22	Compile relevant drought-related documents, including the 1989 proposal from the USFWS. 24-Mar-22 Update: Research what happened in 2007 and 2008 relative to Severe Drought Criteria and create report of research.	Ongoing (Presented at 24-Mar-22 meeting)
ISRB co-secretaries	Schedule call	10-Mar-22	Secretaries to schedule a call with the the Board to go over the drought presentation within the next month or so. Also, invite the COH.	Complete
Board members	Annual Work Plan	10-Mar-22	Board members review the annual Work Plan over the next couple weeks and submit comments	Ongoing – Work plan to be updated and shared for June board meeting
C. Hallborg	Installation of precipitation gauges	10-Mar-22	Consider presentation from C. Hallborg on the proposed installation of precipitation gauges in Saskatchewan at a future board meeting	Ongoing
ISRB co-secretaries	Doodle poll	10-Mar-22	Secretaries to send out doodle poll for scheduling the summer meeting. Maybe look at week of June 13 <sup>th</sup> or early July.	Complete
N. Armstrong	June Meeting Location	10-Mar-22 Updated 24-Mar-22	N. Armstrong will explore potential locations with Canadian members and select a location. 24-Mar-22: N. Armstrong continue work on meeting location and tour ideas	Complete
L. Ackerman	Westhope volume analysis memo	24-Mar-22	NDDWR provide Westhope volume analysis memo to COH to aid in Severe Drought Criteria review	Ongoing

**International Souris River Board**  
**ACTION ITEMS – progress updated May 13, 2022**


ISRB co-secretaries	Meeting invites for June 2022 meetings	24-Mar-22	Co-secretaries send meeting invitation to Board and participants for a public meeting on June 14 <sup>th</sup> and Board meeting on June 15 <sup>th</sup>	Complete
ISRB co-secretaries	Update ISRB presentation for IJC Semi-Annual	24-Mar-22	Co-secretaries update the Board's presentation for the IJC's semi-annual with the suggested path forward on governance review and recirculate to the Board	Complete

# Attachment 1

Presentation on History of Severe  
Drought Criteria

International Souris River Board  
March 24, 2022 Meeting





# SEVERE DROUGHT CRITERIA HISTORY

ISRB Meeting  
March 10, 2022

Laura Ackerman, ND Department of Water Resources  
Girma Sahlu, Environment and Climate Change Canada



Environment and  
Climate Change Canada



Water Resources



# INTERIM MEASURE FOR WESTHOPE

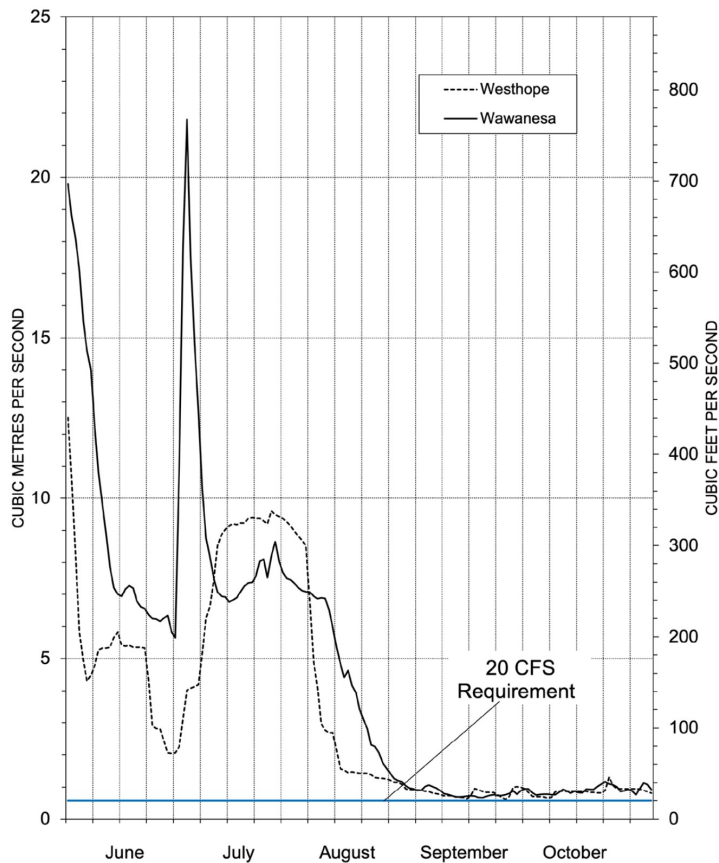


Figure 4 - Souris River near Westhope and Wawanesa from June 1 to October 31, 2020.

North Dakota is required to provide Manitoba with 6,069 acre-feet of water at the Westhope International Crossing from June 1<sup>st</sup> to October 31<sup>st</sup> at a minimum flow rate of 20 cfs (0.57 cms)

# SEVERE DROUGHT CRITERIA INTRO

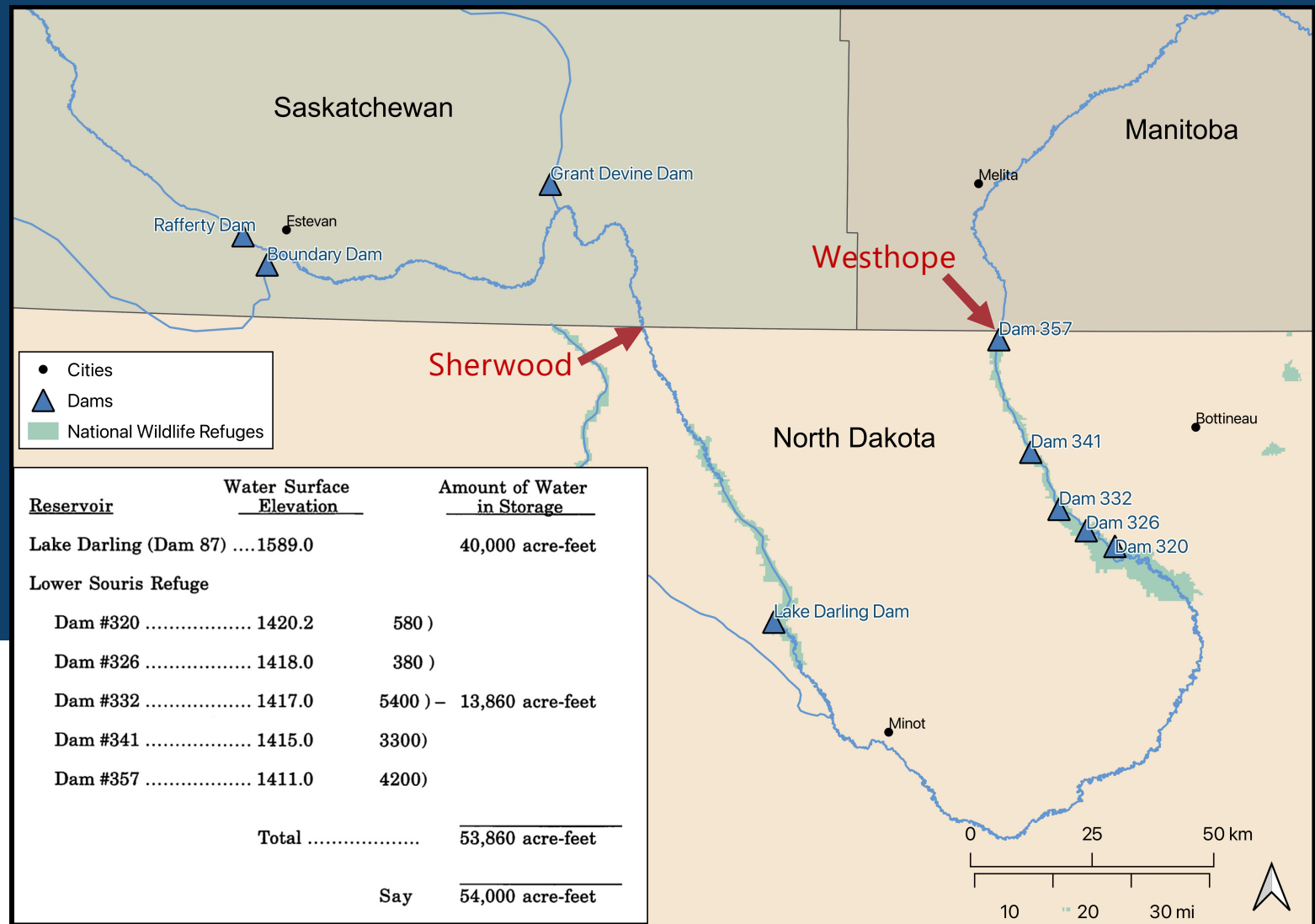
The figure 54,000 acre-feet has been determined from reservoir levels as listed on Table I. "Severe drought" is related to aggregate storage as described above rather than individual reservoir levels.

TABLE I

<u>Reservoir</u>	<u>Water Surface Elevation</u>	<u>Amount of Water in Storage</u>
Lake Darling (Dam 87) ....	1589.0	40,000 acre-feet
Lower Souris Refuge		
Dam #320 .....	1420.2	580 )
Dam #326 .....	1418.0	380 )
Dam #332 .....	1417.0	5400 ) – 13,860 acre-feet
Dam #341 .....	1415.0	3300)
Dam #357 .....	1411.0	4200)
Total .....		53,860 acre-feet
Say		54,000 acre-feet

- US member of the Board will give the Board earliest possible advice concerning the onset of "severe drought"
- Board will decide on the size of a practicable release taking into account general hydrologic conditions and the objective of making water available for human and livestock consumption and for household use
- Severe drought conditions exist when the total amount of water in storage in ND is 54,000 acre-feet

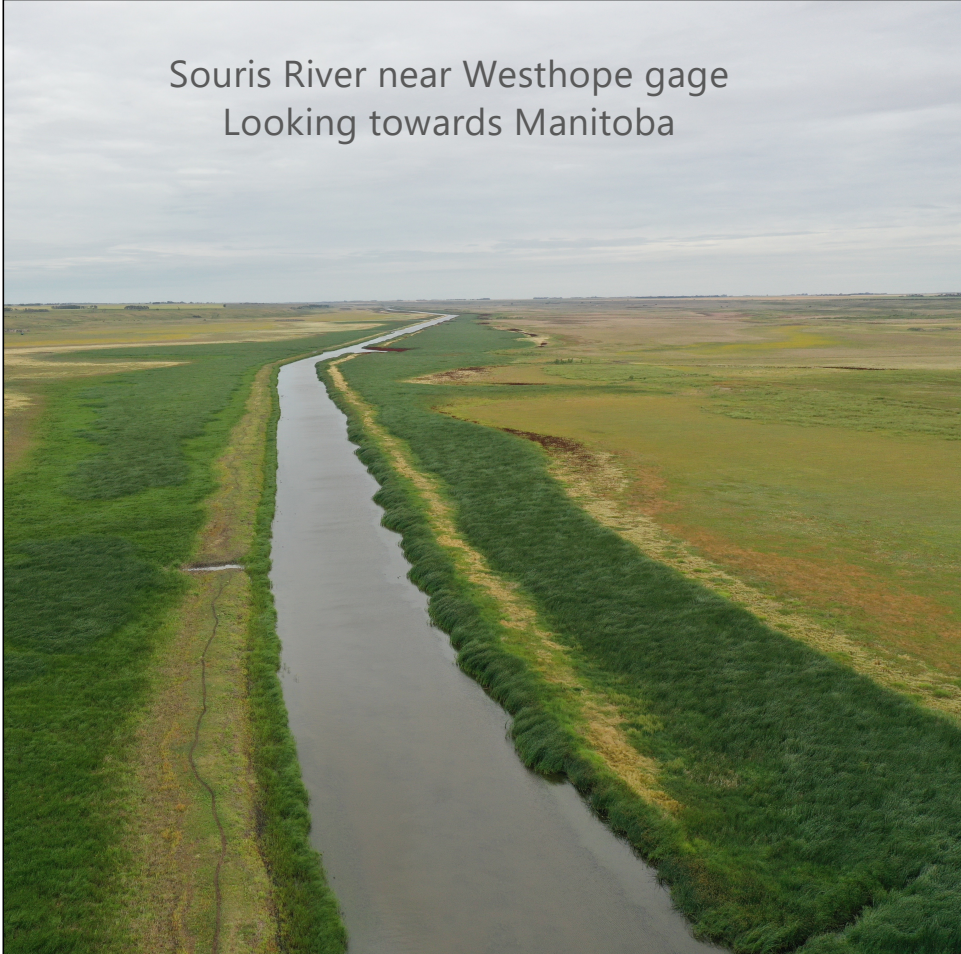
# SEVERE DROUGHT CRITERIA INTRO





# HOW DID WE GET SEVERE DROUGHT CRITERIA?

Souris River near Westhope gage  
Looking towards Manitoba



Lake Darling



# 1958 IJC REPORT TO GOVERNMENTS

(3)(a) In addition to the waters of the Souris River basin which originate in the Province of Manitoba, that Province shall have the right, except during periods of severe drought, to receive for its own use and the State of North Dakota shall deliver from any available source during the months of June, July, August, September, and October of each year, six thousand and sixty-nine (6,069) acre-feet of water at the Westhope Crossing regulated so far as practicable at the rate of twenty (20) cubic feet per second except as set forth hereinafter: Provided, that in delivering such water to Manitoba no account shall be taken of water crossing the boundary at a rate in excess of the said 20 cubic feet per second.

(3)(b) In periods of severe drought when it becomes impracticable for the State of North Dakota to provide the foregoing regulated flows, the responsibility of the State of North Dakota in this connection shall be limited to the provision of such flows as may be practicable, in the opinion of the said Board of Control, in accordance with the objective of making water available for human and livestock consumption and for household use. It is understood that in the circumstances contemplated in this paragraph the State of North Dakota will give the earliest possible advice to the International Souris River Board of Control with respect to the onset of severe drought conditions.



# 1960'S

## CRITERION (b) FROM MINUTE 60A-7 - SOURIS RIVER BOARD OF CONTROL

"When in North Dakota water in storage and tributary inflow diminish to the point where lake Darling has less than 40,000 acre feet in storage and the levels in the lower Souris Refuge pools are less than:

Dam 320	1420.2 feet
Dam 326	1418.0 feet
Dam 332	1417.0 feet
Dam 341	1415.0 feet
Dam 357	1411.0 feet

and the tributary inflow as measured at gauging stations on Des Lacs River at Foxholm, Wintering River near Karlsruhe, Willow Creek near Willow City, Deep River near Upham and Boundary Creek near Landa totals less than 5 c.f.s. an extreme drought condition exists and the release to Manitoba from Dam 357 may be reduced to 10 c.f.s. and maintained at that amount until the minimum conditions defined above are exceeded at one or more of the specified reservoirs. The North Dakota State Engineer shall notify the Canadian Member of the Board of Control and the Director of the Water Control and Conservation Branch (Manitoba Department of Agriculture) when such a condition exists and give said officials at least 10 days advance notice of a reduction of release to 10 c.f.s.

"The Board agreed to accept these criteria on a tentative basis. With a few more years experience it will be possible to see how closely these criteria actually fit the requirements of recommendation 3(b)."

- February 2, 1960: Souris River Board of Control approved severe drought criteria on a tentative basis.
- Took into account storage in Lake Darling and J Clark Salyer pools, along with tributary inflow in ND



# 1960'S

- July 24, 1962: Souris River Board of Control created a committee to review the criteria.
- Board asked the committee to consider:
  - Aggregate storage rather than individual reservoir levels
  - Transmission losses from Lake Darling to the Lower Refuge
  - Any other pertinent matters



# 1960'S

CRITERION (b) as submitted by Messrs Erskine and Strilaeff

prior to our January 22, 1963 meeting

(Dated 4 January 1963)

"Severe Drought Conditions Exists and it may be considered impracticable for the State of North Dakota to deliver at Westhope Crossing the regulated flows of 20 c.f.s. during the months June to October, inclusive, whenever the water in storage in the Upper and Lower Refuge reservoirs is at or below the amount defined as critical. For the purpose of this criterion the critical water levels and contents of the reservoirs are as follows:

Upper Souris Refuge

Lake Darling (Dam 87)	1,589.0 feet	40,000 acre-feet
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Lower Souris Refuge

Dam 320	1,420.2 feet	580 acre-feet
Dam 326	1,418.0 feet	380 acre-feet
Dam 332	1,417.0 feet	5,400 acre-feet
Dam 341	1,415.0 feet	3,300 acre-feet
Dam 357	1,411.0 feet	4,200 acre-feet

Total . . . . . 13,860 acre-feet

"The sum of the critical content for the individual reservoirs, 53,860 acre-feet, is defined as the critical condition for this criterion.

"When the condition defined as critical prevails or is imminent, the release at the Westhope Crossing may be reduced to 10 c.f.s., or to some other amount agreed upon by the Board of Control, provided that the United States member of the Board of Control gives the Canadian member and the Director of the Water Control and Conservation Branch (Manitoba Department of Agriculture and Conservation) at least 10 days advance notice of the proposed reduction.

"The reduced rate of release may be continued until the combined storage in these reservoirs exceeds 57,000 acre-feet. The release may then be increased to 20 c.f.s. or some specified lesser amount upon request by the Canadian member of the Board of Control or other Canadian official he may authorize to act in his behalf."

- January 22, 1963: draft of the revised criteria was presented to the Board
- Took into account storage in Lake Darling and J Clark Salyer pools
- Board asked the committee to redraft so that:
  - It is based on an aggregate storage of 53,860 ac-ft
  - Make allowance for losses if a disproportionate amount of storage is in Lake Darling
  - Eliminate any ambiguity between individual reservoir levels and aggregate storage

# 1960'S

(b) DEFINITION OF "SEVERE DROUGHT" AND "RECOVERY" FROM SAME

The Board will recognize that, for the purposes of interpreting recommendation 3 (b), severe drought conditions exist when the total amount of water in storage, <sup>in Salyer Pools</sup> in North Dakota at dam 87 (Lake Darling), and at dams 320, 326, 332, 341, and 357 (Lower Refuges) is <sup>57,860</sup> 53,860 acre-feet <sup>or less</sup> or less if no more than 74% of this water is impounded at Lake Darling. <sup>If</sup> more than 74% of this water is impounded in Lake Darling then, to allow for conveyance losses, conditions of "severe drought" will exist when the aggregate storage referred to above is 57,000 acre-feet or less.)

"Severe drought" conditions will prevail until storage in <sup>the above reservoirs</sup> in North Dakota recovers so that the total amount of water in storage is 57,000 acre-feet <sup>[(74% or less of the impounded water in Lake Darling)]</sup>, or 60,000 acre-feet <sup>(more than 74% in Lake Darling)</sup>. <sup>h. Recovery to be based on aggregate storage</sup>

The figure 53,860 acre-feet has been determined from reservoir levels as listed on the attached sheet. "Severe drought" is related to aggregate storage as described above rather than individual reservoir levels.

Finally, the mystic figure of 74% which appears in the re-draft is found by dividing 40,000 (Lake Darling storage) by 53,860 (aggregate storage in the system under the old criterion (b)).

- April 1963 correspondence between Board members shows that they were considering a revised version that took into account:
  - Aggregate storage in Lake Darling and J Clark Salyer pools
  - Conditions where a disproportionate amount of water was in Lake Darling compared to the J Clark Salyer pools

# 1960'S

## (b) Definition of "Severe Drought" and "Recovery" from Same

The Board will recognize that, for the purposes of interpreting recommendation 3 (b), severe drought conditions exist when the total amount of water in storage in North Dakota at Dam 87 (Lake Darling) and at Dams 320, 326, 332, 341, and 357 (Lower Refuges) is 54,000 acre-feet.

"Severe drought" conditions will prevail until storage in the above, reservoirs recovers so that the total amount of water in storage is 57,000 acre-feet.

The figure 54,000 acre-feet has been determined from reservoir levels as listed on Table I. "Severe drought" is related to aggregate storage as described above rather than individual reservoir levels.

TABLE I

<u>Reservoir</u>	<u>Water Surface Elevation</u>	<u>Amount of Water in Storage</u>
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Dam #332 .....	1417.0	5400 ) – 13,860 acre-feet
Dam #341 .....	1415.0	3300)
Dam #357 .....	1411.0	4200)
Total .....		53,860 acre-feet
Say		54,000 acre-feet

- May 7, 1963: Board approved a revised version of the severe drought criteria
- Based on aggregate storage in Lake Darling and J Clark Salyer pools
- Approved "with the understanding that they will be reviewed from time to time as indicated by future storage developments or other pertinent consideration."

# 1989 THROUGH 1990'S

UNITED STATES DEPARTMENT OF THE INTERIOR  
FISH AND WILDLIFE SERVICE  
REGION 6

PROPOSAL TO REVISE DROUGHT CRITERIA

February 9, 1989

I. INTRODUCTION

Runoff in the Souris River Basin was limited in all areas (Saskatchewan, North Dakota and Manitoba) during 1988. The reports at this meeting from Environment Canada and the United States Geological Survey demonstrate the severity of the drought.

The Fish and Wildlife Service (Service) presented proposed operating plans for impoundments at Upper Souris and J. Clark Salyer National Wildlife Refuges at the February 3, 1988 meeting of the International Souris River Board of Control (Board). The Service revised these plans after the extent of the drought became known, because the original plans would have nearly eliminated carryover storage in the event of a second dry year. These revised plans were presented to the Board at the meeting on May 19, 1988.

At the May meeting, the Service requested a reduction in the requirement that 20 cubic feet per second (0.57 cubic metres per second) be delivered to Manitoba from June 1 to October 31. Since the total storage in the pools at J. Clark Salyer NWR and in Lake Darling at Upper Souris NWR would not fall below 54,000 acre-feet (66610 cubic decametres) under the revised operating plan, the Board declined to reduce the required flows.

However, the Board did invite the Service to present a proposal for revised drought criteria based upon the runoff received in any given year rather than the carryover storage in Fish and Wildlife Service impoundments. This document responds to that invitation.

- February 9, 1989: USFWS presented a proposal to the Board to revise the criteria
- Recommended limiting flows to MB based on amount of flow available to ND – Sherwood flows plus the natural flow in ND
- Suggested 3 steps to implement:
  1. Agree that the drought criteria should be based on the actual year's flow rather than on stored water
  2. Consider the USFWS proposal
  3. Refine proposal until it is acceptable to all Board members

# 1989 THROUGH 1990'S

Westhope gage with  
Dam 357 in Background



- February 9, 1990: Board member for Canada stated that MB had given up its claim to a percentage of the flow of the Souris River in exchange for a regulated stable flow, and that this was the intention of the interim measure.
- Board agreed that further research was needed to understand the rationale for the criteria



# 1989 THROUGH 1990'S

## MEMORANDUM • GOVERNMENT OF CANADA

LS.R.B.C. Doc. # 0268

TO : Mr. G.L. MacKenzie, Member for Canada, SRBC

YOUR FILE No:

FROM : E.F. Durrant, Chief, Hydrology Division

OUR FILE No: SRBC

SUBJECT: Souris River Board of Control

DATE: Aug. 9/61

The Souris River Board of Control adopted tentative drought criteria at a Meeting in February 1960 (minute 60A-7). The levels of the lower refuges mentioned in those criteria correspond to a total storage of 14,000 acre-feet. At full pool level their total storage is 48,000 acre-feet. Another criterion is that the sum of the U.S. tributary inflow shall be less than 5 cfs. I feel that both of these conditions are suitable as drought criteria from Canada's viewpoint.

However, the "drought criterion" levels of Lake Darling should be examined by the Board of Control. Under criterion (a) when Lake Darling is at 60,000 acre-feet, the North Dakota State Engineer may stop Westhope releases unless Canadian officials notify him that "20 cfs or some specified lesser amount is required to maintain a live stream". Under criterion (b) when Lake Darling is at 40,000 acre-feet, the Westhope releases may be reduced to 10 cfs on 10 days' advance notice.

If Lake Darling at 40,000 acre-feet represents only one year's supply for North Dakota's users plus 10 cfs to Manitoba, the criterion seems reasonable. However, if prudent water use would permit 40,000 acre-feet to supply U.S. demands for two or three years through a typical drought period, then the criterion is not reasonable. Minot and downstream users would have an assured water supply at the expense of a reduced Manitoba flow.

Since the summer of 1961 is a genuine drought year in the Souris basin, current streamflow measurements and reservoir level observations will provide an excellent basis for assessing the fairness of present drought criteria. At the close of the open water season I feel that the Board should sponsor a study to answer the following questions:-

1. What are the minimum water requirements of present users in the North Dakota loop of the Souris?
2. How much water must be released from Lake Darling to supply these uses?

.../2

- May 22, 1990: Board discussed rationale for 54,000 acre-feet trigger
- A 1961 memo suggested that the storage volume was set to provide one year's supply to ND's users plus 10 cfs to MB.
- USFWS expressed concern that the criteria did not allow water to be conserved in preparation for successive years of drought.

# 1989 THROUGH 1990'S



- 1996: Natural Flow Methods Committee investigated Board questions on how revised area-capacity tables for USFWS refuge pools and revised apportionment procedures at Sherwood would affect the criteria.
- Found that Rafferty & Alameda operation increase frequency of severe drought at Westhope from 14% to 20% of years
- Found that updated curves had no impact

# 1989 THROUGH 1990'S

The Committee has developed three options for addressing the increase in frequency of severe drought. Each of the options is strongly opposed by one or more of the impacted entities.

There was some discussion by the Board as to the intent of the original request. It was noted that the modelling results reflected both the change in apportionment and the effect of the operation of Rafferty and Alameda Reservoirs. Mr. Dybvig commented that during the negotiations on the operating plan for the project between Canada and the United States, the potential for the project to increase the frequency of having to impose the drought criteria was recognized.

After some discussion, the Board decided that the Natural Flow Methods Committee had completed the work assigned to them as regards this work item, and thanked them for their efforts. However, the issue of the increase in frequency of severe drought is still unresolved and additional work remains. It was decided that there is a need to research the history of how and why the severe drought criteria was instituted. Ms. Estep-Johnston agreed to research this matter and report her findings to the Board.

- 1996: Natural Flow Methods Committee developed 3 options for addressing increase in frequency of severe drought:
  1. Reduce combined refuge volume to volume that would occur in 14% of years as opposed to 20% of years
  2. Leave volume trigger same, have SK make additional releases that ND passes to MB
  3. No change. MB accept risk of increased frequency



# 1989 THROUGH 1990'S

Report to

**International Souris River  
Board of Control**

by

Megan Estep-Johnston  
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## February 11, 1997 Board meeting

### 97-A-6

At the request of the Natural Flow Methods Committee, Ms. Estep-Johnston reported on the results of her and Mr. White's research into the Severe Drought Criteria with respect to the establishment of the minimum elevations of the refuge pools (Attachment 8). The results of this research indicated that minimum refuge pool elevations were selected on a flow loss analysis basis rather than on a biological basis. Elevations chosen for the lower refuge pools would help ensure that the water released would reach Manitoba.

Mr. Bowering expressed Manitoba's concern over the WRMM model. He noted that it should be able to respond to drought criteria and be revised to reflect current water management in the basin. Manitoba's position is that the next time severe drought criteria was reached, they would question why it would be impractical to provide 20 cfs and, if impractical, then what could be delivered.

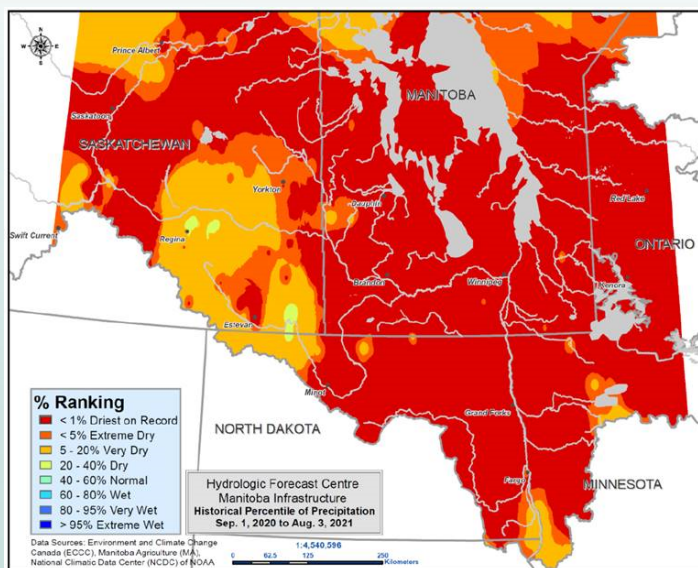
No resolution was reached on this issue. No further steps will be taken until the next severe drought occurs.

# 2021 INTO 2022

## % Ranking Precipitation Since September 2020 (August 3<sup>rd</sup>)



- By end of July, MB portion of the Souris River Basin have received **record low precipitation** since Sept 2020 when compared to precipitation records since 1950.



- Board held special meeting on September 2, 2021 due to drought conditions and concerns regarding ability to meet Westhope Interim Measure
- Action item to research history of severe drought criteria
- Found that the Board has discussed this issue several times
- Concerns regarding the severe drought criteria seem to remain unresolved