

Ducks Unlimited Canada – Technical Submission

- 1. What control structures have Ducks Unlimited Canada built in the Carrot Saskatchewan River watershed? Are these structures still operational? Are any of the structures in poor condition? Where are these structures located? What were/are the purposes of these structures? Are there any issues that the planning team should be aware of?**

The Saskatchewan River Delta (SRD) has an extensive history of marsh management activities dating back to the 1930's when the Hudson Bay Company initiated the development of the Cumberland Marshes near Cumberland House, Saskatchewan. Private and government interests conducted similar activities in Manitoba. Ducks Unlimited Canada (DUC) has also developed several individual projects and marsh complexes dating back to the 1940's although major developments occurred in the 1960's and 70's. The more recent activities occurred following predictions of significant habitat loss and degradation resulting from the hydroelectric developments. The DUC projects were originally designed to primarily hold water and management typically consisted of a combination of removing excess local runoff and stabilizing water levels during the summer months to enhance waterfowl production. In recent years developments and management activities have focused on restoring some of the hydrologic events that were lost due to the altered flow regimes caused by the hydroelectric dams.

DUC manages water levels within the SRD under the authority and through agreements with Manitoba Conservation and Water Stewardship. DUC has 4 wetland projects within the boundaries of the Carrot Saskatchewan River watershed. This includes the Carrot River Triangle, Reader-Root Complex, Summerberry Marsh Complex and the southern end of the Tom Lamb Wildlife Management area (See Figure 1).

The following is a project specific summary of the DUC managed wetlands within the Carrot Saskatchewan River watershed.

Carrot River Triangle (CRT)

Comprising over 100,000 acres the DUC Carrot River Triangle (CRT) project consists of 7 managed basins as well as numerous unmanaged wetlands and associated uplands under agreement. The CRT is found within Manitoba's Saskeram Wildlife Management Area in the upper Saskatchewan River delta and receives water primarily from the Birch River (Cumberland Marsh), Elm Creek, and overbank or backup waters from the Birch, Carrot and Saskatchewan Rivers. DUC development in the CRT dates back to the 1940's when the control at Bracken Dam was constructed on the Birch River near the Carrot River. In the 1960's additional structures were added at Birch Lake, Elm Creek and Lake 6. In the 1980's the entire complex was redeveloped to provide a more effective means of drawdown and flow handling. This included a bypass channel that would take Birch River water around Birch Lake and down Cooks Creek where it could be passed into Saskeram Lake, or out a new structure – the North Outlet on a channel leading to the Saskatchewan River.

Saskatchewan River Delta

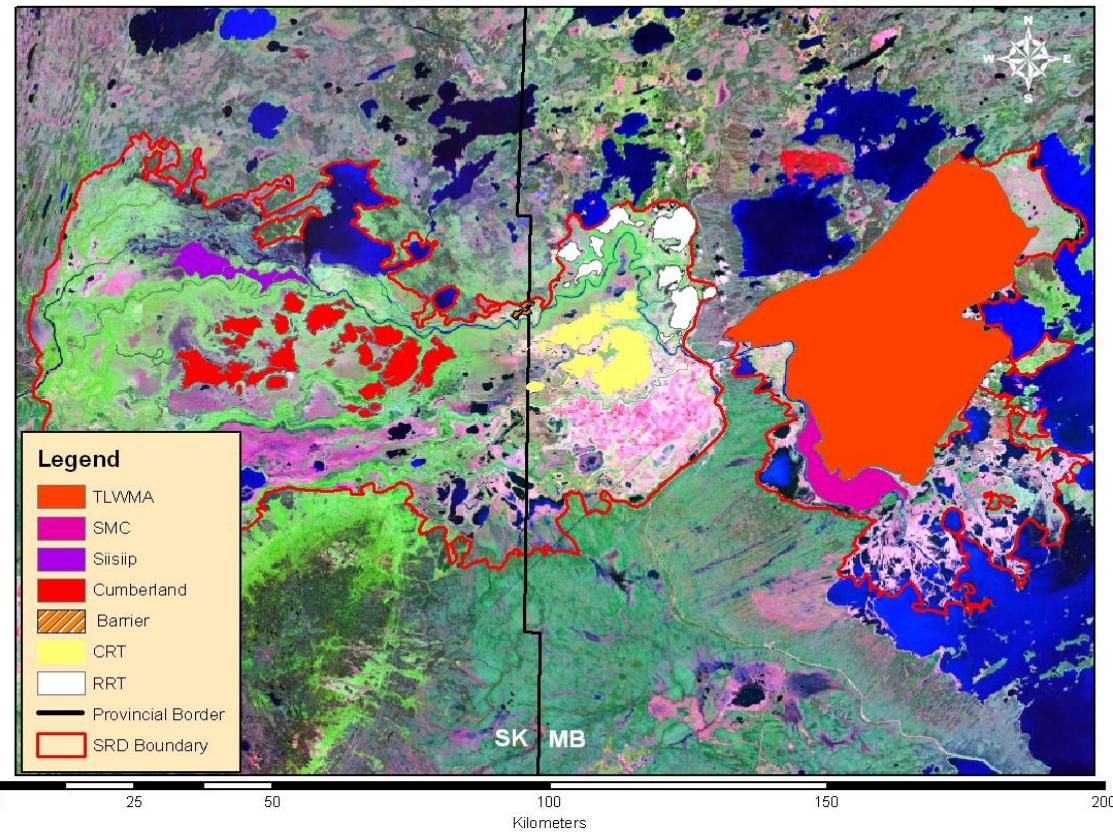


Figure 1: Ducks Unlimited Canada Wetland Project Boundaries within the Saskatchewan River Delta

Many of the control structures are in need of some maintenance or repairs, while other structures are in need of replacement or removal. A re-development plan for the CRT based on estimated future needs and available resources was developed. The remote nature of the control structures, and resource limitations have resulted in a multi-year gradual approach to re-development of the project. The CRT construction is in year two of proposed two to three years of construction in the Saskatchewan River Delta. Once the long range plan work is completed, there will be 8 variable control structures and 3 fixed crest rock structures in CRT, a change from 16 variable controls and 1 fixed crest prior to redevelopment. When the 5 control structures are replaced this winter, the remaining physical works in CRT will be considered to be in good condition

The original design of the CRT water control structures was to emulate pre-hydro water conditions, optimize resources and maintain the structural integrity of the works. DUC works were designed and are operated primarily for waterfowl, but take into account other wetland species, particularly aquatic furbearers and moose as these are of significant local concern. Fish movement and their entrapment in the marshes are potential issues and water flow management, especially of the Bracken Dam fishway requires periodic monitoring and manipulation of that structure. Agricultural activities are conducted on low-lying Crown lands immediately adjacent to the south boundary of the CRT project. Recent and significant Saskatchewan River overland flooding, specifically the 2011 and 2013 flood events (both one in one hundred year flood frequencies) caused flooding well beyond Full Supply Level in the CRT marshes and on the adjacent Crown leased lands. DUC staff diligently operated control structures to release the unprecedented flood waters from these areas.

Frequent communication is carried out with local Manitoba Conservation & Water Stewardship, the Opaskwayak Cree Nation Natural Resource Council, local trappers, agricultural Crown lease holders and all other interested stakeholders.

Reader – Root Complex (RRC)

DUC's 105,000 acre RRC consists of 8 wetlands as well as associated uplands and wet meadows protected under agreement. Reader Root is a portion of the Saskeram Wildlife Management Area in the upper Saskatchewan River Delta in Manitoba, and receives water primarily from Rocky Lake via Rocky Creek, backing in of water from the Saskatchewan River via South Reader Lake and overbank flow from the Saskatchewan River. Historically water backed up from the Saskatchewan River during high levels into the marshes at Whitefish Creek and The Reader Cut-off. DUC's first involvement with this complex began with the construction of a dam on Watchi Bay in 1941. Other wetlands have since been provided with water control - Rocky Creek in 1947 and Reader Lake in 1958.

In the early 1980's, it was proposed that new water controls would be constructed at the inlet of North Reader Lake, the outlet of North Reader Lake, the inlet of South Reader Lake, the Root Lake outlet, and Watchi Bay. Approximately 2500 metres of dyke was constructed to separate

North and South Reader Lake, as well as internal ditching to provide or improve the drawdown capabilities within each of the segments, completed in 1991. These wetlands are generally managed to provide both waterfowl nesting and staging habitat, while the shallow peripheral areas provide valuable spring feeding locations. Presently most physical works in RRC are in good condition.

The original design of the RRC water control structures was to emulate pre-hydro water conditions, optimize resources and maintain the structural integrity of the works. DUC works were designed and are operated primarily for waterfowl, but take into account other wetland species, particularly aquatic furbearers and moose as these are of significant local concern. Fish and their possible entrapment in the marshes are a potential issue and water flow management, especially at the Rocky Creek fishway requires periodic monitoring and manipulation of that structure. DUC has spent almost \$700,000 on project operation and management at the Rocky Creek control – exponentially higher than at any other location across the country. Over half of this cost has occurred in the last 15 years - mainly in managing floating vegetation which impedes the water flow out of the Rocky Creek control. It is important to note that the probable root cause of the floating vegetation problem in Rocky Creek is the raising and stabilizing of Rocky Lake water levels by the control structure, the same feature that made the lake an attractive cottaging and outfitting location. DUC is currently in discussion with Manitoba Conservation & Water Stewardship and local Rocky Lake Stakeholders about the future viability of a fixed crest control structure, while retaining the fishway at this location.

Frequent communication is carried out with local Manitoba Conservation & Water Stewardship, the Opaskwayak Cree Nation Natural Resource Council, local trappers, Rocky Lake Fisheries President, Rocky Lake residents, Rocky lake business owners and all other interested stakeholders.

Summerberry Marsh Complex (SMC)

The 35,000-acre DUC Summerberry Marsh project consists of 35 basins managed with 24 water control structures, as well as numerous unmanaged wetlands and associated uplands. This project is in the lower Saskatchewan River Delta (SRD) in Manitoba and most of the project basins are located between the Summerberry and Saskatchewan Rivers, with a few lying south of the Saskatchewan River. The marshes receive water primarily from overbank flooding from either rivers, or backup through stream channels, and local runoff. DUC developments in Summerberry date back to the late 1970's but the area had a variety of previous government developed water management works, primarily to manage habitat for muskrats that date back to the 1930's. DUC completed most of the construction of the present physical works in the late 1970's to early'80's, but also inherited several government controls dating back to the 1960's, that have been subsequently replaced by DUC.

Management objectives in the Summerberry Marsh Complex, as elsewhere, are targeted to emulate natural conditions, optimize resources and maintain the structural integrity of works. The intent of the original design and the modifications to the operation of controls from that, are primarily to emulate historic periodic high and low water levels that occurred as a result of Saskatchewan River flows, prior to development of the Grand Rapids Hydro station and forebay that flooded existing wetlands and drastically altered the flow regime. In the case of Summerberry this includes preventing the reversed hydrology effects on marshes that could result from Cedar lake reservoir operation (i.e. low spring levels and high fall levels annually). Winter flows tend to be almost double the pre-Hydro average and summer flows, especially peak flows, are reduced through the operation of upstream EB Campbell and Gardiner SaskPower dams. DUC works were designed and are operated primarily for waterfowl, but take into account other wetland species, particularly aquatic furbearers and moose as these are of significant local concern. Fish and their possible entrapment in the marshes are a potential issue that has not seemed to be problematic in SMC. The abundant presence of beaver and lack of trapping in this area has rendered efficient operation at many of the control structures near impossible. The combination of beavers plugging the control structures or installing beaver dams further upstream in pilot channels greatly impedes achievement of annual water level targets on these wetlands. Physical works are considered to be in good condition.

Frequent communication is carried out with local Manitoba Conservation & Water Stewardship, Opaskwayak Cree Nation Natural Resource Council, local trappers, and all other interested stakeholders.

Tom Lamb Wildlife Management Area (TLWMA)

The DUC Tom Lamb project consists of over 100 wetlands and associated uplands mostly under protected status (almost 0.5 million acres) and consists of the entire provincial Tom Lamb Wildlife Management Area. During the 1940's and 1960's the provincial government constructed 3 large water control structures and the 2 Island dike in an effort to regulate water levels in the southern half of this vast wetland system, with the goal of increased wildlife / fur production.

Presently there are 3 sub-complexes of basins within the boundaries of the Carrot Saskatchewan River Watershed. The Tom Lamb area is in the lower SRD, and historically its water supply was from overbank flow or local runoff passing down the above noted creeks in a west to east pattern. With the creation of the Grand Rapids hydro reservoir (Cedar Lake), backwater effects interrupted the flow, and external diking was put in place by Manitoba Hydro, and internal diking by government and DUC, to mitigate the anticipated back flood. Present DUC control operation is limited to those basin sub complexes within the boundaries of the Carrot Saskatchewan River Watershed that empty into the Summerberry River and primarily to pass excessive water, namely the One Man, Red Earth and Amisk basins. Maintenance and operation responsibility is shared by DUC, Manitoba Hydro and Manitoba Conservation and Water Stewardship.

Operation and wetlands management are primarily to achieve the biologically prescribed operating level, or in the case of Red Earth, pass outflows from a much broader area than DUC linked by channels during the 1960's development. Care must be taken during any operations to insure fish access to the wetlands from the Summerberry River does not occur. This can usually be accomplished through timing the discharge outside of spawning periods and regulating the rate of outflow.

Management objectives in Tom Lamb are unlike that elsewhere in DUC managed portions of SRD, as the capability to emulate natural ebb and flow conditions is not possible with the current physical works and adjacent hydro reservoir levels. The goal in Tom Lamb is instead to try to prevent further deterioration of wetlands and associated uplands habitat in the sub complex area.

Frequent communication is carried out with local Manitoba Conservation & Water Stewardship, Opaskwayak Cree Nation Natural Resource Council, local trappers, Manitoba Hydro and other interested stakeholders.

- 2. As a result of dams and control structures, the watershed regularly experiences surface water fluctuations. These fluctuations impact agriculture and residents in the watershed in both positive and negative ways. Are there management plans in place to support the long-term sustainability of these structures owned by Ducks Unlimited Canada? Are there concerns with adequate funding to properly maintain and operate these structures?**
- 3. Are there plans to decommission any water control structures? If so, which structures and why? What will the impacts of decommissioning be?**

Over time many of the control structures have deteriorated and are in need of some maintenance or repairs, while other structures are in need of replacement or removal. This may include decommissioning of water control structures at some locations in the SRD. The impacts as result of decommissioning will vary by location and annual weather variables.

A re-development plan for the SRD based on estimated future needs and available resources has been developed. The remote nature of the control structures and resource limitations has resulted in a multi-year gradual approach to re-development. DUC has developed a rebuild strategy based on DUC adaptive management principles, shortage of future capital and the need for government to be actively engaged in land use planning and management. The CRT construction is in year two of proposed multi-year re-investment in the Saskatchewan River Delta infrastructure.

- 4. What would you recommend as a good indicator for monitoring watershed health in the Carrot-Saskatchewan River watershed?**

The Carrot-Saskatchewan River Watershed is incredibly complicated and covers a large area that involves many aspects of the environment; water, land, air, wildlife, and people all influence each other and the environment. I would recommend a combination of 6 major watershed categories that are commonly used to monitor watershed health: Water supply, riparian health, wildlife, land use, air quality and community values.

5. Does Ducks Unlimited Canada have any target areas for protection in the Carrot-Saskatchewan River watershed? Are any of these target areas specific to the Saskatchewan River Delta?

DUC manages water levels within the SRD under the authority and through agreements with Manitoba Conservation and Water Stewardship. DUC has 4 wetland projects within the boundaries of the Carrot Saskatchewan River watershed. This includes the Carrot River Triangle, Reader-Root Complex, Summerberry Marsh Complex and the southern end of the Tom Lamb Wildlife Management area (See Figure 1).

6. Can you provide any specific management practices for protection of the Saskatchewan River Delta?

DUC management objectives in the SRD are targeted to emulate natural conditions, optimize staff and resources and maintain the structural integrity of works. The intent of the original design and the modifications to the operation of controls from that, are primarily to emulate historic periodic high and low water levels that occurred as a result of Saskatchewan River flows, prior to developments (hydro dams) that drastically altered the flow regime.

DUC creates annual water level operating plans for each wetland within the SRD. These plans are annually presented and reviewed each spring by Manitoba Conservation & Water Stewardship, Opaskwayak Cree Nation Natural Resource Council and other interested stakeholders for the Carrot-Saskatchewan River Watershed area. A final plan is developed based on the feedback from all parties. In 'normal' climatic and weather years, DUC tries to achieve the summer water level conditions by June 15th to allow wetland levels to stabilize during waterfowl nesting season. After peak waterfowl nesting has occurred, DUC may begin to operate control structures again, dependent on the summer target operating level. DUC strives to have water control structures operations completed by September 15th each year to allow wetlands to stabilize in time for muskrats to construct their houses at a desired level for the winter period. However, in years such as 2011 and 2013, water level operations varied from planned as result of the 1 in 100 year flood events from the Saskatchewan River. Only in extreme flood events do DUC wetlands fluctuate out of normal operating range.

7. Are there any priority wetlands in this watershed that are considered to be at risk and should be preserved?

8. Where should activities such as wetland protection, wetland restoration or water retention be targeted in the watershed?

DUC manages water levels within the boundaries of the Carrot Saskatchewan River Watershed, under the authority and through agreements with Manitoba Conservation and Water Stewardship. DUC's focus is to provide landscapes capable of supporting DU's continental conservation goals through the retention and restoration of their ecological integrity. The SRD is one of the largest freshwater deltas in the world and an internationally recognized Important Bird Area that provides important nesting and migration habitat for waterfowl and other waterbirds, especially in times of drought on the prairies. But it is also important to the economic and cultural well-being of aboriginal people who rely on the fishing, trapping, hunting and tourism opportunities that the delta provides. The delta also benefits society in general through the water filtration, carbon sequestration, and drought/flood attenuation qualities that all wetlands provide.

The SRD is an ever-changing landscape – created through a mix of flooding and ice jams; new river channels forming and banks collapsing; trees uprooting and wetland vegetation drying out; and many other natural forces. And it's all dependent on the ebb and flow of the river and the wet/dry cycles that occur naturally from year to year. The priority of a wetland can change annually based on climatic conditions and target water operating levels.