Beneficial Management Practices (BMPs) being assessed at the Steppler-South Tobacco Creek project

- Five beneficial management practices (BMPs) are being assessed within the Steppler-South Tobacco Creek Watershed as part of Agriculture and Agri-Food Canada's Watershed Evaluation of BMPs (WEBs) Project. The South Tobacco Creek Watershed sits approximately 150 kilometers southwest of Winnipeg, Manitoba, and is part of the Red River Basin. Over the past 15 years, numerous studies looking at the relationship between agricultural practices, water quality and water quantity have taken place in this small watershed. Agronomic and climate data collected through these studies have provided a great deal of background data for the WEBs study.

MAP

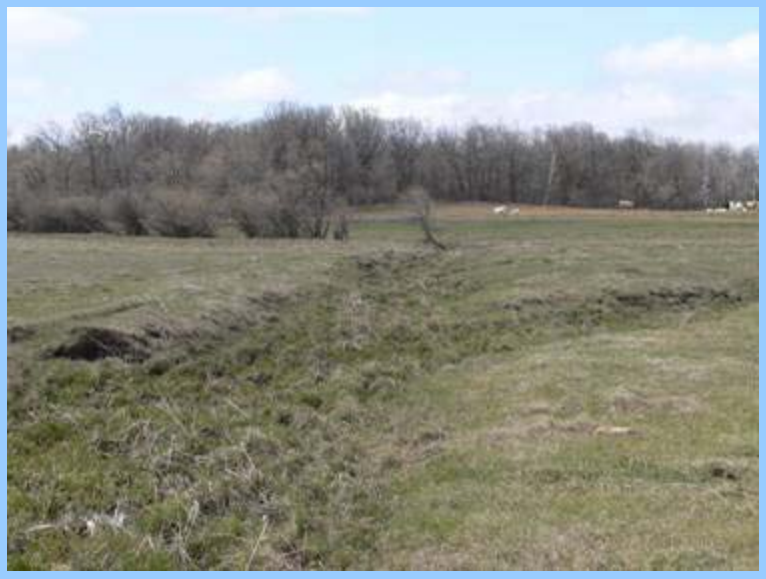
- The bulk of the BMPs for this project are being assessed within the Steppler farm. The watershed covers an area of 2.28 ha and is outlined in red on the map above. With the cooperation of the landowner, the watershed was sub-divided into numerous fields (sub-watersheds) to facilitate land practice changes and water quantity/quality monitoring. The various fields are identified as F1, F2, etc. and the field area, in hectares, is provided below the field identification. Runoff monitoring and water-sampling sites are identified as Ms1, Ms2, etc. In addition to the runoff monitoring and water sampling, soil, snow and trash material (surface material) sampling are taking place within the sub-watersheds. Two fields (F10 and F11) just north of the main study area are also included in land practices assessment.

MAP

Converting Cropland to Forage

This photo shows the divide between two sub-watersheds (fields F1 and F2 **MAP**) farmed under two different practices. Land use for the watershed on the right has been converted to forage from annual crop. The watershed on the left remains in annual crop and has been cultivated after the crop was removed (a normal practice by the producer). The forage field was seeded with an oats cover crop and depicts late-season re-growth after alfalfa and oats were harvested. The water quantity and quality is being monitored for each of the two sub-watersheds to assess the impact of converting cropped land to forage. Two other sub-watersheds (fields F7 and F9 **MAP**) are being monitored for a similar comparison.

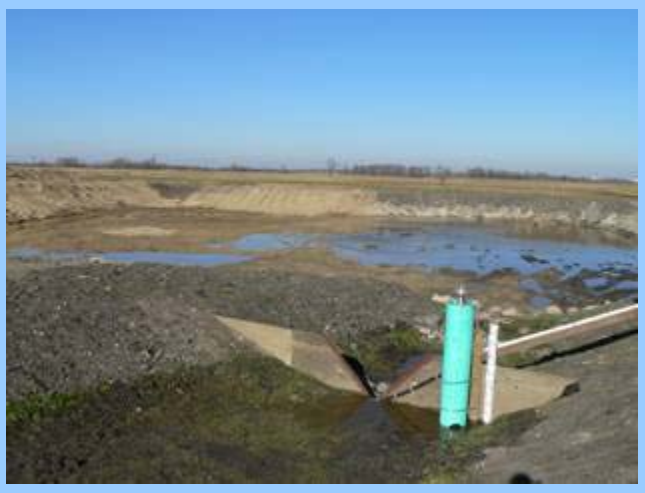
Riparian Area Enhancement and Management



These two photos (above and to the right) depict a sub-watershed (field F5 MAP) used to pasture cattle and as a corridor to move cattle from the pasture areas to the farmyard for watering. As a result, the pasture and riparian areas were overgrazed. In order to improve the riparian, stream and pasture areas, the cattle have been given limited access to the pasture through the introduction of rotational grazing and an off-site (remote) watering system. The sub-watershed is not grazed beyond mid August.

The stream within the sub-watershed (field F8 MAP) shown in the photo on the left had no riparian buffer area. To improve the riparian area, the banks of the stream were graded back, increasing the stream width. The photo was taken shortly after the newly sloped area was seeded to grass. The streambed was not graded so as to minimize disturbance of the streambed. The forage will be mechanically harvested and cattle will not be allowed to graze the area.

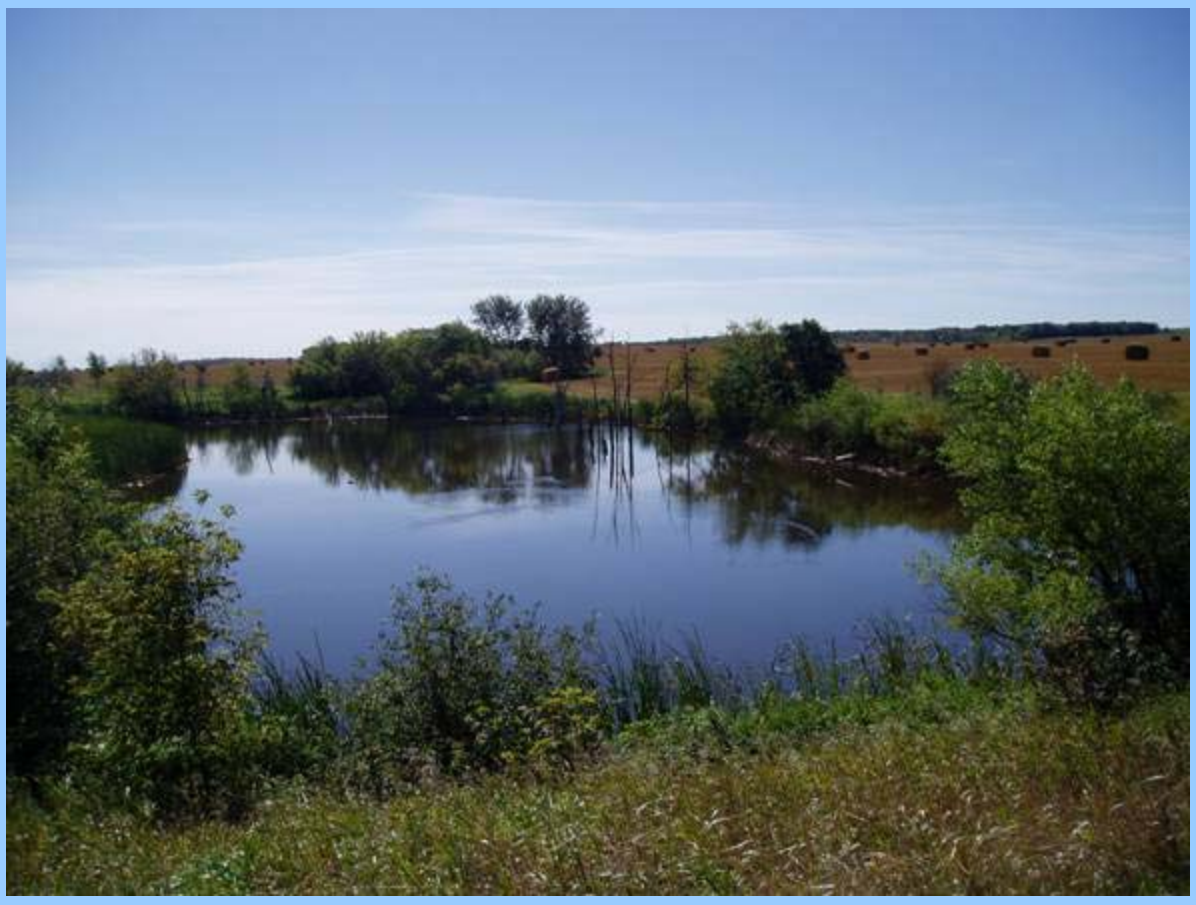
Holding Pond Used to Capture Runoff from a Cattle Containment Area



A holding pond was constructed to temporarily store runoff from a winter feeding area (field F6 MAP). The pond was designed to store approximately 75 mm of runoff from the 1.7 ha cattle containment area. The pond will store up to 1 metre of water. This photo was taken shortly after construction and, as a result, vegetation is just starting to develop. The photo shows a weir and water-level equipment installed to monitor the quantity of water going into the pond. Water samples are collected based on the rate of flow.

This photo depicts the drain path from the cattle containment area to the water holding pond. The main drain and drains within the cattle containment area have been fenced to eliminate any access by the cattle. The pond had to be constructed a distance away from the cattle area because of a high water table and soil conditions.

The Use of Small Reservoirs to Reduce Downstream Nutrient Loading



Shown in the photo is one of two small reservoirs being monitored for inflow and outflow, along with water sampling to assess the impact of the small reservoir on downstream nutrient loading. The monitoring of runoff commenced shortly after the reservoir's construction in the early 1990s, while the sampling of water flowing in and out of the reservoir was initiated in 1999. The reservoir is located at the base of the Steppler-South Tobacco Creek Watershed and will provide accumulative impact data about the BMPs incorporated in the Steppler Watershed. A second similar assessment site, the Madill Reservoir, can be found on the location map.
MAP

Runoff and nutrient loading from a zero tillage field vs. a conventionally tilled field

The photo shows two sub-watersheds (fields F10 and F11 **MAP**) used to compare the runoff and nutrient loading from a zero-tillage field and a conventionally-tilled field. The zero-till field sits on the right, the conventional-till field on the left. Runoff monitoring and water sampling equipment located on each of the sub-watersheds is visible near the top of the photo, along the field line. The project was started in the early 1990s and the two sub-watersheds were farmed similarly for fours years to establish runoff and nutrient loading baseline conditions. One watershed (on the right) was then converted to zero tillage.